

Technical Memorandum

Second Quarter 2012 (2Q12) Update for Ponds 16S and 18A RCRA Pond Phosphine Assessment Study

July 16, 2012

1.0 INTRODUCTION

This technical memorandum (“tech memo”) documents the second quarter 2012 (2Q12) update of the phosphine assessment study evaluations for Ponds 16S and 18A as proposed in Section 5.0 of the *Technical Memorandum - First Quarter 2012 Update for Ponds 16S and 18A - RCRA Pond Phosphine Assessment Study* (“1Q12 Update Tech Memo,” MWH, 2012b) and is the second update to the *RCRA Pond Phosphine Assessment Study Report* (“*Assessment Study Report*,” MWH, 2012). Updated tabulated data, graphical evaluations and recommendations for modification of the assessment study monitoring program at Pond 16S and/or 18A are included in this tech memo.

This tech memo follows the same organization as the *Assessment Study Report*. The Ponds 16S and 18A 2Q12 monitoring programs are summarized in Section 2, monitoring results are summarized in Section 3, updated evaluations of cumulative results are contained in Section 4, and Section 5 presents updated interim findings and recommendations.

During an EPA-FMC conference call on April 25, 2012 that, in part, included a discussion of EPA comments on the *1Q12 Update Tech Memo*, EPA requested and FMC agreed to develop a framework for long-term phosphine monitoring at the RCRA Ponds that would be the basis for Section 3 of the RCRA Pond amended post-closure plan. As agreed during that conference call, FMC is submitting the Framework for Post-Closure Phosphine Monitoring at the RCRA Ponds concurrently with this 2Q12 update tech memo.

2.0 MONITORING PROGRAMS AT POND 16S AND 18A DURING 2Q12

Section 2 of the *Assessment Study Report* summarized the monitoring elements and timeline of the RCRA Pond UAO and Assessment Study work plans performed through December 2011 and Section 2 of the *1Q12 Update Tech Memo* updated the monitoring elements for Ponds 16S and 18A during 1Q12. Those summaries are not repeated here.

The elements, timeline and schedule of monitoring at Ponds 16S and 18A during 2Q12 pursuant to the *RCRA Pond UAO Air Monitoring Plan – Part I* (“*Air Monitoring Plan*,” MWH, 2011) and modified as recommended in the *1Q12 Update Tech Memo* are summarized below:

Pond	Cap Perimeter Surface Scan and Appurtenance Monitoring ¹			
	Frequency	Initiated	End of 1 st Year	Frequency 2Q12
18A	Monthly	Oct 2010	Sep 2011	Quarterly/Monthly ²
16S (perim \geq 2,000)	Monthly	April 2012 ³	NA	Monthly

1 Appurtenance monitoring includes air release (breathing zone) and leak detection. Contingent cap surface and/or low-lying areas monitoring would be on same schedule if triggered.

2 As recommended in the *1Q12 Update Tech Memo*, FMC increased the Pond 18A perimeter surface scan and appurtenance monitoring frequency to monthly beginning in May 2012 to align the Pond 18A monitoring with the Pond 16S monitoring with respect to the *Air Monitoring Plan*.

3 As reported in the *1Q12 Update Tech Memo*, the Pond 16S north perimeter pipe monitoring result on April 3, 2012 was greater than 2,000 ppm, which triggered monthly cap perimeter and appurtenance monitoring pursuant to the *Air Monitoring Plan*. Monthly cap perimeter and appurtenance monitoring was initiated in April (performed on April 4, 2012).

The Pond 16S soil gas, perimeter pipe standpipe and TMP monitoring and Pond 18A soil gas and perimeter pipe standpipe monitoring performed pursuant to the *Assessment Study Work Plan* as modified by the *Assessment Study Report* is summarized below:

Pond	Monitoring	Sampling Pts	Start Monitoring	Frequency 2Q12
18A	Soil Gas ¹	10 / 8	Oct-10	Monthly
	Perim Pipe	2	Dec-10	Monthly
16S	Soil Gas	14	Dec-10	Monthly
	Perim Pipe	4	Oct-10	Monthly
	TMP	8	Nov-10	Monthly

1 Shallow / step-out soil gas sampling points. Step-outs installed during week of April 25, 2011 and monitoring commenced May 4, 2011.

3.0 RESULTS OF MONITORING AT POND 16S AND 18A

Section 3 of the *Assessment Study Report* summarized the RCRA Pond UAO monitoring results through January 13, 2012. Those results are not repeated here, with the exception of the tables of monitoring results for Ponds 16S and 18A that have been updated as described below.

The 2Q12 (April through June) Pond 16S and 18A monitoring results have been submitted electronically to EPA in the monthly RCRA Pond UAO reports through June 2012. The Pond 16S and 18A monitoring results through July 10, 2012 that will be reported with the full July 2012 monthly report are summarized in this section. Monitoring results through July 10, 2012 were used for the data evaluations presented in Section 4.0.

3.1 Pond 16S

As reported in the *1Q12 Update Tech Memo*, the Pond 16S north perimeter pipe monitoring result on April 3, 2012 was greater than 2,000 ppm, which triggered monthly cap perimeter surface scan and appurtenance monitoring. As shown on Table 3.3b (Updated 2Q12), phosphine (PH3) was not detected during the 2Q12 perimeter surface scan events. Phosphine was not detected during the 2Q12 appurtenance ambient air and leak detection monitoring events at Pond 16S as shown on Table 3.10 (Updated 2Q12). Phosphine was not detected inside appurtenances with the exception of low PH3 reported (0.18 and 0.04 ppm, respectively) inside cap drainage lift stations 1 and 2 at Pond 16S during the April 2012 monitoring event and PH3 reported (0.02 and 1.89 ppm) inside Pond 16S LCDRS sump 2 during the June 11 and July 10, 2012 monitoring events. The July inside result at Pond 16S LCDRS sump 2 was 1.89 ppm and recheck on the afternoon of July 10, 2012 was reported at 0.43 ppm PH3.

Soil gas monitoring was performed at Pond 16S monthly during April through July 2012 as shown on Table 3.11 (Updated 2Q12). Phosphine was not detected in the breathing zone or near (4 to 6 inches above) the ground surface during any of the soil gas monitoring events at Pond 16S from December 2010 through July 9, 2012. Phosphine was detected in all fourteen of the soil gas probes during the 2Q12 monitoring events. Of the total 56 soil gas readings (4 monitoring events at the 14 probes) during April through July 2012, 11 (20%) of the readings were 0.00 ppm PH3. The PH3 results ranged from 0.01 to 24 ppm for the 45 non-zero PH3 readings. Thirty eight (84%) of the 45 non-zero readings were below 0.3 ppm, one (2%) was between 0.3 and 1.0 ppm, five (11%) were between 1.0 and 10 ppm, and one (2%) was above 20 ppm PH3.

Pond perimeter gas collection pipe monitoring at Pond 16S was performed monthly during April through July 2012 as shown on Table 3.9b (Updated 2Q12). All four standpipes (north, south, east and west) were monitored. Phosphine was not detected in the breathing zone during any of the perimeter pipe monitoring events at Pond 16S. Phosphine was detected in the perimeter pipe source gas at concentrations ranging from 8.12 ppm (at west standpipe) to 5,214 ppm (at north standpipe) on July 9, 2012.

Temperature monitoring point (TMP) monitoring at Pond 16S was performed monthly during April through July 2012, as shown on Table 3.12 (Updated 2Q12). Phosphine was not detected in the breathing zone during any of the TMP monitoring events at Pond 16S from November 2010 through July 9, 2012. During April 2012, PH3 concentrations ranged from 3,041 to 23,528 ppm in individual TMPs and averaged 12,959 ppm. As expected, PH3 concentrations continued to increase (“rebound”) during 2Q12 and, in July 2012, PH3 concentrations ranged from 5,063 to 41,415 ppm in individual TMPs and averaged 18,388 ppm. A more detailed discussion of the Pond 16S TMP, perimeter pipe and soil gas monitoring results is presented in Section 4.0.

3.2 Pond 18A

As recommended in the *1Q12 Update Tech Memo*, FMC increased the Pond 18A perimeter surface scan and appurtenance monitoring frequency to monthly beginning in May 2012 to align the Pond 18A monitoring with the Pond 16S monitoring with respect to the *Air Monitoring Plan*. Monthly perimeter surface scans were performed May to July 2012 as shown on Table 3.3b. Phosphine was not detected during the Pond 18A perimeter surface scan events.

Monthly appurtenance monitoring was performed May to July 2012 as shown on Table 3.14 (Updated 2Q12). Phosphine was not detected during the 2Q12 appurtenance ambient air and leak detection monitoring events at Pond 18A. Phosphine was not detected during the inside appurtenance monitoring with the exception of PH3 detected inside the LS-01 instrument panel at 0.25 ppm on April 5, 2012 and inside the LS-01 manhole at 3.46, 10.3 and 0.29 ppm during the April, May and June 2012 monitoring events. All of the July 5, 2012 appurtenance monitoring results were 0.00 ppm PH3 including monitoring inside the LS-01 manhole.

Shallow and step-out soil gas monitoring was performed at Pond 18A monthly during April through July 2012 as shown on Table 3.16 (Updated 2Q12). Phosphine was not detected in the breathing zone or near (4 to 6 inches above) the ground surface during any of the shallow or step-out soil gas monitoring events at Pond 18A. Phosphine was detected in seven of the ten shallow and five of the ten step-out soil gas probes during the 2Q12 monitoring events. Of the total 40 shallow soil gas readings (4 monitoring events at the 10 shallow probes) during April through July 2012, 23 (58%) of the readings were 0.00 ppm PH3. The PH3 results ranged from 0.01 to 9.70 ppm for the 17 non-zero PH3 readings. Ten (59%) of the 17 non-zero readings were below 0.3 ppm, two (12%) were between 0.3 and 1.0 ppm, 4 (24%) were between 1.0 and 20 ppm, and zero (0%) were above 20 ppm PH3. Of the total 32 step-out soil gas readings (4 monitoring events at the 8 step-out probes) during April through July 2012, 21 (66%) of the readings were 0.00 ppm PH3. The PH3 results ranged from 0.01 to 1.27 ppm for the eleven non-zero PH3 readings. Nine (82%) of the non-zero readings were below 0.3 ppm, one (9%) was between 0.3 and 1.0 ppm and one (9%) was between 1.0 and 5.0 ppm PH3. There were no readings above 5.0 ppm PH3 for the step-out soil gas probes.

Pond perimeter gas collection pipe monitoring at the south and east standpipes was performed monthly during April through July 2012 as shown on Table 3.9b (Updated 2Q12). The PH3 concentrations in the south and east perimeter pipe source gas ranged from 874 to 1,354 ppm and 3,386 to 5,094 ppm, respectively, during 2Q12. A more detailed discussion of the Pond 18A perimeter pipe and soil gas monitoring results is presented in Section 4.0.

4.0 EVALUATION OF MONITORING RESULTS

The Ponds 16S and 18A monitoring results through July 10, 2012 were used to complete the data evaluation updates presented below.

4.1 Pond 16S

As stated in the *Assessment Study Report*, the concept for the assessment monitoring at Pond 16S during the study period has been to evaluate the “rebound” of PH3 concentrations beneath the final cap in order to develop a relationship between PH3 concentrations in TMPs, pond perimeter piping, perimeter soil gas and the potential for detection (release) of PH3 in ambient air at levels that could represent a risk to human health and the environment.

Figure 4-3 (Updated 2Q12) shows the Pond 16S average TMP and average and individual standpipe perimeter pipe monitoring results for November 30, 2010 through July 9, 2012 (85 weeks). As shown on the figure, the average TMP concentration continued to follow the increasing trend as discussed in the *Assessment Study Report*. An exponential regression using Microsoft Excel provides the best fit for the TMP data and yields an exceptionally high coefficient of prediction (R^2) of 0.99. Visually, the average perimeter pipe standpipe concentration continued to follow an increasing trend as discussed in the *Assessment Study Report*.

As shown on Figure 4-4 (Updated 2Q12), the average TMP PH3 concentration trend remained representative of individual TMPs during 2Q12. The average TMP concentration trend line remained very close to the TMPs 7 and 8 (south side) trends, TMP 1 (north) and 5 and 6 (south) trend lines remained above the average trend, and TMP 2, 3 and 4 (north) trend lines remained below the average trend. The TMP 1, 5 and 6 steepened increasing trend that began about December 6, 2011 (week 54) and moderated from March 7 to April 3 (week 71), continued during 2Q12 with TMP 1, 5 and 6 PH3 concentrations increasing about 30, 76 and 32 percent, respectively, over the quarter. The increasing trend in PH3 concentration at the other TMPs (2, 3, 4, 7 and 8) remained relatively steady through 2Q12 and increased between 18 percent (TMP 4) and 66 percent (TMP 3) between April 3 and July 6, 2012.

The Pond 16S perimeter pipe PH3 monitoring results are shown on Figure 4-5 (Updated 2Q12). Visually, the north and east standpipe results show an increasing trend while the south and west standpipe data do not show a trend. The average standpipe concentration trend follows the increasing trend of the north and east standpipe data. An exponential regression using Microsoft Excel provides the best fit for the average perimeter pipe data, but yields a relatively poor coefficient of prediction (R^2) of 0.68; however, the updated trend graph and regression yield a slightly higher R^2 than the regression on the data through April 2012 as presented in the *1Q12 Update Tech Memo*. The results of regression evaluation on the north and east perimeter pipe data remained similar to the average.

As described in the *Assessment Study Report* and *1Q12 Update Tech Memo*, the variability of perimeter pipe monitoring results is likely influenced by the trend in barometric pressure preceding the monitoring event. Observationally, higher PH3 concentrations in perimeter pipe are associated with a falling barometer while concentrations tend to decrease during a rising barometer. As noted in the *Assessment Study Report*, the monitored PH3 concentration in perimeter pipe appears to be influenced by a changing barometric pressure trend over 24 or more hours prior to monitoring and not the absolute barometric pressure at the time of monitoring. The June 11, 2012 PH3 concentration in the north and east standpipes were lower than the April and May results. An increasing barometric pressure trend (steady rise from 25.2 to 25.6 inches Hg) over the 48 hours preceded the June 11, 2012 monitoring event. The north and east perimeter pipe results for July are the highest to date and showed a resumption of the increasing trend that began in December 2011. The barometric pressure was relatively steady (25.55 to 25.65 inches Hg) over the 48 hours with a drop to 25.45 inches and rise to 25.65 inches Hg during about 12 hours preceding the July 9, 2012 monitoring event.

As described in the *Assessment Study Report*, the spatial variability in the PH3 concentrations between the four standpipes (i.e., spatial variability) continued through 2Q12. The consistent variability in PH3 concentrations at the standpipes appears to reflect the non-uniform gas distribution in the heterogeneous fill materials under the final cap rather than differences in flow from the perimeter pipe standpipes.

During an EPA-FMC conference call on May 23, 2012 to discuss the monitoring programs under the RCRA Pond UAO, EPA raised a question regarding the spatial variability of PH3 concentrations and specifically noted the PH3 concentrations in the south TMPs 5, 6, 7 and 8 are higher than the north TMPs (other than TMP 1) whereas the north perimeter pipe standpipe consistently has the highest PH3 concentrations compared to the other three standpipes. During that call, FMC noted that the perimeter pipe standpipe monitoring represents PH3 concentrations over a larger area (linearly) than the TMPs that are essentially “point” samples. The screening level monitoring procedure for the TMPs and perimeter pipe standpipes are similar; however, a TMP is purged for 10 minutes whereas a standpipe is purged to remove at least one perimeter pipe volume (which is dependent on the gas flow and volume of the perimeter collection pipe system). For both the TMP and standpipe screening level monitoring, a readings is taken at 10 minutes (for TMPs) or at the time one perimeter pipe volume is purged and then two additional readings are taken at 10 minute intervals after the initial reading. The three readings are averaged for the reported result.

The average flow rate from the Pond 16S TMPs during monitoring is 10 cubic feet per minute (cfm) during purging and is decreased to 1 cfm in order to take the three readings (for the TMPs a sample pump and PH3 meter has to be connected at the TMP so the flow is reduced so the sample pump does not experience a vacuum). As shown on Table 4.1, the total volume of gas purged from the TMPs during the screening level monitoring is about 120 cubic feet (cf).

Assuming the gas volume is extracted from soil pore space with an effective porosity of 10 percent within a 3 foot column of soil surrounding the bottom of the TMP, the radius of influence being monitored around the bottom of TMP would be about 11 feet.

During the last few rounds of monitoring, the average flow rate from the north standpipe has been about 5.5 cfm and from the east, south and north about 9.5 cfm. The flow rate at the north standpipe has been lower due to higher source PH₃ concentrations (compared to the other standpipes) and necessary dilution to meet the mobile GES inlet concentration. As shown on Table 4.1, the total volume of gas purged from the north and other standpipes during the screening level monitoring is about 260 and 285 cubic feet (cf), respectively. These purge volume are about 2.8 to 3.1 times the total volume of the Pond 16S (perimeter and diagonal cross-tie) gas collection piping system. The gas extracted from the standpipes likely extracts more gas from the perimeter perforated pipe nearer the T connection and the pressure gradient decreases with distance from the T connection. Assuming a radius of influence of 2 feet from the perimeter pipe in the liner foundation material (sand) surrounding the perforated collection pipe and into the slag fill, both with an effective porosity of 10 percent, the effective length of influence would be about 200 feet. Assuming uniform flow from both sides of the T connection, the screening level monitoring at the standpipes is monitoring gas beneath the cap over an area of about 100 feet on each side of the standpipe T connection to the perimeter pipe.

In summary, the TMP monitoring results represent a relatively small area within the fill a few feet above the pond solids whereas the perimeter pipe monitoring results represent a broader area of fill immediately beneath and inside the cap anchor trench. Although the TMP monitoring results, when averaged, are useful to support estimation of the net PH₃ generation (or accumulation) rate, the perimeter pipe monitoring results are a better indicator of the average PH₃ concentration over a broader area at the outer edge of the cap system.

The Pond 16S soil gas monitoring results are shown on Figure 4-7 (Updated 2Q12). Unlike the results through January 2012, PH₃ was detected in all of the soil gas probes during 1Q12 and 2Q12. Phosphine concentrations greater than 20 ppm were measured during the March 6, 2012 monitoring at probes 5 and 6 (south side, near the south standpipe); probes 9 and 10 (north side, near west end); and, 11 and 12 (north side, near the north standpipe). The PH₃ concentration at probe 12 was also greater than 20 ppm during the April 3, 2012 monitoring. However, the soil gas PH₃ concentrations were lower during the May and June monitoring with the highest reading of 0.19 ppm at probe 11 in May and 0.09 ppm at probe 12 in June. The July 9, 2012 soil gas monitoring results were higher than May and June with the highest reading of 6.27 ppm at probe 5. As an update, the data sets from soil gas probes 5, 11 and 12 (the rationale for evaluating these soil gas results is described in the *Assessment Study Report*) were re-evaluated for trend using the non-parametric Mann-Kendall test, two-sided at the 95% confidence level ($\alpha = 0.05$). The Mann-Kendall test for trend is recommended as a robust non-parametric test for trends in data over time. For these data sets $n=21$ and the critical Z-score equals 1.97 (if $|Z| > 1.97$, then p

< 0.05 and trend is significant). The results of the Mann-Kendall trend tests are summarized below:

- Probe 5 shows no significant trend (Z-score of 1.54, p-value of 0.12);
- Probe 11 shows an increasing trend (Z-score of 2.5, p-value of 0.012); and,
- Probe 12 shows an increasing trend (Z-score of 2.82, p-value of 0.005).

The 2Q12 trend results for data through July 9, 2012 with respect to no trend at probe 5 and increasing trend at probes 11 and 12 are the same as the test for trend results for the 1Q12 data through April 3, 2012.

As described in the Assessment Study Report, the soil gas monitoring results are likely influenced by the trend in barometric pressure preceding the monitoring event similar to the perimeter pipe results. The soil gas results for probes 5 and 11 exhibited a pattern of temporal variability similar to the north and east perimeter pipe monitoring results, although with a much lower magnitude as shown on Figure 4-8 (Updated 2Q12). As described above, a rising barometric pressure trend preceded the June perimeter pipe and soil gas monitoring event and relatively steady barometric pressure preceded the July monitoring event. The highest PH3 result for Pond 16S soil gas probes during the June event was 0.09 ppm at probe 12 and the highest result during the July event was 6.27 at probe 5.

The 2Q12 soil gas monitoring results were lower than the March 6, 2012 results that represent maximum soil gas results to date at Pond 16S. Consistent with the results through April 2012 reported in the Assessment Study Report and *1Q12 Update Tech Memo*, PH3 was not detected in the breathing zone and ground level (4 to 6 inches AGS) readings during the 2Q12 soil gas monitoring events.

During the study period, including 2Q12, PH3 was not detected during any of the perimeter surface scans and appurtenance ambient air and leak detection monitoring events at Pond 16S. Low PH3 was reported (0.18 and 0.04 ppm, respectively) inside cap drainage lift stations 1 and 2 at Pond 16S during the April 2012 monitoring event and PH3 was reported (0.02 and 1.89 ppm) inside Pond 16S LCDRS sump 2 during the June 11 and July 10, 2012 monitoring events. The July inside result at Pond 16S LCDRS sump 2 was 1.89 ppm and recheck on the afternoon of July 10, 2012 was reported at 0.43 ppm PH3. Phosphine was not detected inside any other appurtenances.

Overall, the Pond 16S TMP PH3 concentration ranges measured during 2Q12 continued the increasing trend discussed in the *Assessment Study Report*. As of July 2012, PH3 concentrations increased at the north and east perimeter pipe compared to March and April and continued the increasing trend discussed in the *1Q12 Update Tech Memo*. While the 2Q12 soil gas results were lower than the March maximums, the results through July 2012 show a statistically significant increasing trend in shallow soil gas probes 11 and 12. During 2Q12, phosphine was

not detected during the perimeter surface scan, appurtenance ambient air and leak detection monitoring and breathing zone and ground level (4 to 6 inches AGS) readings during the soil gas monitoring events. These non-detect results indicate that the current PH3 concentrations beneath the Pond 16S cap have a low potential for PH3 release to ambient air at levels that could represent a potential threat to human health and the environment.

4.2 Pond 18A

The monitoring results prior to and during operation of the GES unit connected to east perimeter piping at Pond 18A are summarized in the *Assessment Study Report* and not repeated here. An update of the evaluation of Pond 18A post-GES operation PH3 monitoring data is presented below.

As shown on Figure 4-10 (Updated 2Q12), after GES operation was suspended on October 5, 2011, Pond 18A east perimeter pipe PH3 concentrations were in the range of 1,200 to 2,500 ppm during December 2011 and January 2012 and the PH3 concentration had increased steadily (approximately a 180% increase over the 1Q12 period) to about 5,100 ppm as of April 4, 2012. In the south standpipe, PH3 concentrations were in the range of 450 to 550 ppm during December 2011 and January 2012 and the PH3 concentration had increased moderately to 900 ppm as of April 4, 2012. The Pond 18A east and, to a lesser degree, south perimeter pipe standpipe PH3 concentrations show an increasing trend that began in December 2011 and continued until April 2012 but moderated (flattened) over 2Q12. During 2Q12, east perimeter pipe PH3 concentrations were in the range of 3,386 to 5,094 ppm and the south perimeter pipe PH3 concentrations were in the range of 874 to 1,354 ppm and the trend in the east and south standpipe concentrations moderated (compared to 1Q12). The Pond 18A east and south perimeter pipe standpipe results did not appear to be influenced by changing barometric pressure during the 2Q12 monitoring events. The spatial variability in the PH3 concentrations between the east and south standpipes (i.e., spatial variability) remained consistent through 2Q12.

The Pond 18A soil gas monitoring results are shown on Figures 4-10 and 4-12 (Updated 2Q12). Consistent with the 1Q12 soil gas results, PH3 was detected in seven of the ten shallow and five of the ten step-out soil gas probes during the January through April 2012 monitoring events. The moderation of PH3 concentrations in the perimeter pipe during 2Q12 is also reflected in shallow soil gas PH3 results that were lower than the March 6, 2012 maximum (to date) results for soil gas monitoring at Pond 18A as shown on Figure 4-12 (Updated 2Q12). Unlike the March 6 and 22, 2012 soil gas monitoring results, the 2Q12 soil gas monitoring results did not appear to be influenced by changing barometric pressure during the 2Q12 monitoring events. Consistent with the results reported in the *Assessment Study Report* and *1Q12 Update Tech Memo*, PH3 was not detected in the breathing zone and ground level (4 to 6 inches AGS) readings during the 2Q12 soil gas monitoring events.

Phosphine was not detected during the inside appurtenance monitoring with the exception of PH3 detected inside the LS-01 instrument panel at 0.25 ppm on April 5, 2012 and inside the LS-01 manhole at 3.46, 10.3 and 0.29 ppm during the April, May and June 2012 monitoring events. All of the July 5, 2012 appurtenance monitoring results were 0.00 ppm PH3 including monitoring inside the LS-01 manhole.

During 2Q12, phosphine was not detected during the perimeter surface scans, appurtenance ambient air and leak detection monitoring and breathing zone and ground level (4 to 6 inches AGS) readings during the soil gas monitoring. These non-detect results indicate that the current PH3 concentrations beneath the Pond 18A cap have a low potential for PH3 release to ambient air at levels that could represent a potential threat to human health and the environment.

5.0 UPDATED FINDINGS AND RECOMMENDATIONS FOR 16S AND 18A

The Assessment Study and additional monitoring through 2Q12 meet the first UAO Task 1A objective with respect to Pond 16S. As expected and confirmed by data evaluation, PH3 concentrations in TMPs, perimeter pipe and shallow soil gas (through 2Q12) at Pond 16S are increasing. As described in the Phosphine Assessment Study Work Plan (“*Work Plan*”), the intent of the study is to establish a relationship between data such as the range of PH3 concentrations in perimeter piping, in perimeter soil gas, and at the ground surface around the pond perimeter and appurtenances to develop a trigger(s) for additional (more frequent) monitoring and/or gas extraction.

Figure 5-1a (Updated 2Q12) is a graph of the Pond 16S average TMP, north perimeter pipe and soil gas probe 11 that illustrates the relationship between PH3 concentrations at these monitoring points over the study period. The perimeter pipe concentration greater than 2,000 ppm that was found during the April 3, 2012 monitoring at the north standpipe triggered increased frequency (monthly) for surface scan and appurtenance monitoring (pursuant to provisions of the Air Monitoring Plan), as shown on Figure 5-1a and Table 5.1 (Updated 2Q12). Figure 5.1a also shows a Microsoft Excel generated best-fit regression through the data. As described above, the coefficient of prediction (R^2) for an exponential regression on the average TMP concentration is very high (0.99). The July 9, 2012 average TMP concentration was about 18,400 ppm which is close to the “increase above 20,000 ppm during 2Q12” predicted in the *1Q12 Update Tech Memo*. As shown on Figure 5-1b, an exponential regression through the north standpipe results from week 50 (November 8, 2011) to July 9, 2012 yields a relatively high R^2 of 0.86 and the perimeter pipe concentration at the north standpipe was about 5,200 ppm which is close to the “increase to the range of 6,000 to 8,000 ppm during 2Q12” predicted in the *1Q12 Update Tech Memo*.

Likely due to barometric pressure trend influences, the best-fit regression on the soil gas probe 11 data from week 45 (October 5, 2001 – prior detections were less than 0.1 ppm) to July 10, 2012 is a second order polynomial that indicates a decreasing trend and has a very poor R^2 of

0.11. Thus, as indicated by the dashed green line for the soil gas probe 11 regression on Figures 5-1a and 5-1b, any prediction regarding future soil gas monitoring results would be highly speculative. Because the surface scans to date at Pond 16S have not detected PH₃, Figure 5-1a does not show any surface scan results. Phosphine was and is expected to be detected eventually during surface scans as was assumed on Figure 5-1 in the *Work Plan*. As such, the Pond 16S data cannot fully meet the second objective. However, continuation of the monitoring program will yield additional data that may meet the second study objective with respect to Pond 16S during 2012.

The Assessment Study and monitoring through 2Q12 meet the first objective with respect to Pond 18A. As described above, Pond 18A east and, to a lesser degree, south perimeter pipe standpipe PH₃ concentrations measured during 2Q12 show an increasing trend that began in December 2011. Per EPA's request, FMC provided an update on the Pond 18A perimeter pipe concentrations on May 14, 2012 that included Figures 5-2 and 5-3 with results through the week of May 7, 2012. On Figures 5.2 submitted in May, the exponential regression using Microsoft Excel that provided the best fit for the east perimeter pipe data yielded a relatively good coefficient of prediction (R^2) of 0.80. As shown on Figures 5-2 (Updated 2Q12), the trend graph and regression yielded a lower R^2 of 0.67 for the best fit exponential regression. The lower R^2 is due to the moderation of the trend in PH₃ concentrations in the east perimeter standpipe during 2Q12. As shown on Figure 5-2 (Updated 2Q12), the best-fit regression on the results from shallow soil gas probe 2 from November 22, 2011 to July 5, 2012 is exponential and has a very poor R^2 of 0.12. Thus, as indicated by the dashed line for the soil gas probe 2 regression, any prediction regarding future soil gas monitoring results would be highly speculative.

Figure 5-3 showed the decreasing PH₃ concentration by month during continuous GES operation at the east standpipe. For example, during GES operation, the June 2011 average (shown as June 30) was about 19,000 ppm PH₃, after one month of GES operation the July 2011 average (shown as July 31) was about 15,500 ppm PH₃. Based on previous GES operation at Pond 18A, if the east perimeter pipe concentration increased to about 15,500 ppm, two months of continuous GES operation would decrease the average PH₃ concentration to below 8,000 ppm (and probably below 4,000 based on post-GES operation decrease from October 5 to November 8 monitoring results). Figure 5-3 (Updated 2Q12) has been updated with the east and south perimeter standpipe results through July 5, 2012.

The current monitoring program for the RCRA Ponds is summarized on Table 5.1 (Updated 2Q12). In addition to monthly reporting and review of the results from the extension of the Assessment Study monitoring, FMC will conduct the next quarterly (3Q12) update of the evaluations for Ponds 16S and 18A with respect to meeting the second study objective and will submit a 3Q12 Update Tech Memo by October 15, 2012. The 3Q12 update will include updated tabulated data, graphical evaluations and, potentially, recommendation(s) for further

modification of the monitoring program and/or recommendation(s) for commencing gas extraction and treatment at Pond 16S and/or 18A.

REFERENCES

- EPA, 2010. "RCRA Pond Unilateral Administrative Order for Removal Actions," EPA Region 10, June 2010.
- MWH, 2011. "RCRA Pond UAO – SOW Task 1 – Air Monitoring Plan – Part I and Part II." January 2011.
- MWH, 2011b. "RCRA Pond Phosphine Assessment Study Work Plan - Final." November 2010, Revised July 2011.
- MWH, 2012. "RCRA Pond Phosphine Assessment Study Report." January 2012.
- MWH, 2012b. "Technical Memorandum - First Quarter 2012 Update for Ponds 16S and 18A - RCRA Pond Phosphine Assessment Study." April 11, 2012.

Table 3.3b Ponds 16S and 18A Perimeter Surface Scan Monitoring Results Summary (Updated 2Q12)

Date	Pond 16S		Pond 18A		Comment
	Breathing zone	Breathing zone	Breathing zone	Detection	
July/August - 10	NS		0.00	No	
October-10	0.00	No	0.00	No	
November-10	NS		0.00	No	
December-10	NS		0.00	No	
January-11	NS		NW		18A was snow covered for the month.
February-11	0.00	No	0.00	No	
March-11	NS		0.00	No	
April-11	NS		0.00	No	
May-11	0.00	No	0.00	No	
June-11	NS		0.00	No	
July-11	NS		0.00	No	
August-11	0.00	No	0.00	No	
September-11	NS		0.00	No	
October-11	NS		0.00	No	Pond 18A enhance monitoring (10/10/11).
			0.00	No	Pond 18A enhance monitoring (10/25/11).
November-11	NS		0.00	No	Pond 18A (11/8/11).
			0.00	No	Pond 18A (11/21/11).
December-11	NS		NW		18A was snow covered for the month.
January-12	NS		0.00	No	
February-12	NS		NS		
March-12	0.00	No	0.00	No	Ponds 16S and 18A (3/21/12).
April-12	0.00	No	NS		Ponds 16S (4/4/12).
May-12	0.00	No	0.00	No	Pond 16S (5/7/12) and Pond 18A (5/8/12).
June-12	0.00	No	0.00	No	Pond 18A (6/7/12) and Pond 16S (6/11/12).
July-12	0.00	No	0.00	No	Pond 18A (7/5/12) and Pond 16S (7/9/12).

Notes

NS = not surveyed per monitoring schedule in Air Monitoring Plan.

NW = not completed due to weather / snow cover conditions.

Table 3.9b Ponds 16S and 18A Perimeter Pipe Monitoring Results Summary (Updated 2Q12)

Month	Pond 16S												Pond 18 Cell A					
	West Standpipe			South Standpipe			East Standpipe			North Standpipe			South Standpipe			East Standpipe		
	Date	BZ	Source	Date	BZ	Source	Date	BZ	Source	Date	BZ	Source	Date	BZ	Source	Date	BZ	Source
July/August-10	-	-	-	-	-	-	-	-	-	-	-	-	7/22	0.00	7,123	-	-	-
October-10	-	-	-	10/21	0.00	0.00	-	-	-	-	-	-	-	-	NS	-	-	-
November-10	-	-	-	11/30	0.00	0.00	-	-	-	-	-	-	-	-	NS	-	-	-
December-10	-	-	-	12/16	0.00	0.00	-	-	-	-	-	-	12/15	0.00	3,464	-	-	-
January-11	-	-	-	1/13	0.00	34	-	-	-	-	-	-	1/20	0.00	3,467	1/17	0.00	19,155
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/20	0.00	17,880
February-11	2/15	0.00	43	2/2	0.00	0.99	2/23	0.00	1.07	2/23	0.00	241	2/22	0.00	3,798	2/22	0.00	19,625
March-11	3/2	0.00	3.58	3/2	0.00	28	3/2	0.00	14	3/2	0.00	202	3/3	0.00	2,833	-	-	-
	3/17	0.00	2.07	3/17	0.00	8.78	3/17	0.00	3.12	3/16	0.00	335	3/17	0.00	3,511	-	-	15,187
April-11	4/12	0.00	0.46	4/11	0.00	21	4/11	0.00	34	4/12	0.00	269	4/12	0.00	7,187	-	-	-
	4/27	0.00	0.26	4/26	0.00	15	4/26	0.00	37	4/27	0.00	165	4/26	0.00	4,327	-	-	18,637
May-11	5/11	0.00	0.00	5/11	0.00	0.21	5/11	0.00	60	5/11	0.00	284	5/12	0.00	2,772	-	-	-
	5/24	0.00	1.90	5/23	0.00	459	5/24	0.00	138	5/24	0.00	523	5/25	0.00	3,453	-	-	19,270
June-11	6/6	0.00	117	6/7	0.00	92	6/6	0.00	229	6/6	0.00	770	6/7	0.00	3,740	-	-	-
	6/21	0.00	0.07	6/20	0.00	8.34	6/20	0.00	138	6/20	0.00	610	6/21	0.00	4,043	-	-	18,956
July-11	7/6	0.00	0.08	7/5	0.00	11	7/5	0.00	125	7/5	0.00	383	7/6	0.00	2,892	-	-	-
	7/26	0.00	8.08	7/25	0.00	204	7/25	0.00	289	7/25	0.00	623	7/26	0.00	4,182	-	-	15,410
August-11	8/8	0.00	0.74	8/8	0.00	52	8/8	0.00	470	8/8	0.00	1,382	8/9	0.00	2,798	-	-	-
	8/22	0.00	0.06	8/23	0.00	76	8/22	0.00	231	8/22	0.00	983	8/23	0.00	2,716	-	-	11,801
September-11	9/6	0.00	0.04	9/7	0.00	0.06	9/6	0.00	160	9/6	0.00	362	9/7	0.00	2,168	-	-	-
	9/19	0.00	0.43	9/19	0.00	173	9/19	0.00	199	9/19	0.00	476	9/19	0.00	1,579	-	-	8,253
October-11	10/3	0.00	0.34	10/4	0.00	658	10/3	0.00	668	10/3	0.00	1,297	10/4	0.00	1,780	10/10	0.00	3,505
	10/24	0.00	51	10/25	0.00	2.41	10/24	0.00	593	10/24	0.00	825	-	-	-	10/25	0.00	1,707
November-11	11/7	0.00	0.07	11/8	0.00	0.03	11/7	0.00	161	11/7	0.00	369	-	-	-	11/8	0.00	1,136
	11/21	0.00	0.03	11/21	0.00	1.65	11/21	0.00	219	11/21	0.00	453	11/22	0.00	309	11/22	0.00	1,137
December-11	12/6	0.00	0.07	12/5	0.00	20	12/5	0.00	249	12/5	0.00	281	12/6	0.00	461	12/6	0.00	1,240
	12/19	0.00	33	12/19	0.00	50	12/19	0.00	503	12/19	0.00	915	12/20	0.00	548	12/20	0.00	2,503
January-12	1/4	0.00	2.96	1/4	0.00	21	1/4	0.00	291	1/3	0.00	718	1/3	0.00	515	1/3	0.00	1,795
February-12	2/9	0.00	0.16	2/9	0.00	5	2/8	0.00	500	2/8	0.00	1,186	2/6	0.00	663	2/8	0.00	2,090
March-12	3/5	0.00	238	3/5	0.00	737	3/5	0.00	1,319	3/5	0.00	1,732	3/6	0.00	807	3/6	0.00	3,491
	3/21	0.00	5	3/21	0.00	15	3/21	0.00	1,264	3/21	0.00	1,996	3/22	0.00	900	3/22	0.00	3,788
April-12	4/3	0.00	15.67	4/3	0.00	98	4/3	0.00	1,458	4/3	0.00	3,319	4/4	0.00	880	4/4	0.00	5,094
May-12	5/7	0.00	21	5/7	0.00	12	5/7	0.00	1,464	5/7	0.00	3,672	5/8	0.00	874	5/8	0.00	3,747
June-12	6/11	0.00	0.67	6/11	0.00	22	6/11	0.00	886	6/11	0.00	2,166	6/5	0.00	1,354	6/5	0.00	4,338
July-12	7/9	0.00	8.12	7/9	0.00	70	7/9	0.00	2,057	7/9	0.00	5,214	7/5	0.00	981	7/5	0.00	3,386

Notes:

Pond Perimeter Collection Pipe Breathing Zone (BZ) and Source Concentration.

Pond 18A east standpipe concentrations are average concentration from GES units for March through September 2011.

Table 3.10 Pond 16S Appurtenance Monitoring Results Summary (Updated 2Q12)

TMP Enclosure												
Date	T-01						T-02					
	Ambient Air		Leak Detection			Inside	Ambient Air		Leak Detection			Inside
	Ambient	BZ	Base	Lid	PO		Ambient	BZ	Base	Lid	PO	
July-10	NS	NS	NS	NS	-	-	NS	NS	NS	NS	-	-
10/26/10	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-
2/8/11	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-
5/17/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8/18/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4/4/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/7/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/11/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7/10/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TMP Enclosure												
Date	T-03						T-04					
	Ambient Air		Leak Detection			Inside	Ambient Air		Leak Detection			Inside
	Ambient	BZ	Base	Lid	PO		Ambient	BZ	Base	Lid	PO	
July-10	NS	NS	NS	NS	-	-	NS	NS	NS	NS	-	-
10/26/10	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-
2/8/11	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-
5/17/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8/18/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4/4/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/7/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/11/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7/10/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TMP Enclosure												
Date	T-05						T-06					
	Ambient Air		Leak Detection			Inside	Ambient Air		Leak Detection			Inside
	Ambient	BZ	Base	Lid	PO		Ambient	BZ	Base	Lid	PO	
July-10	NS	NS	NS	NS	-	-	NS	NS	NS	NS	-	-
10/26/10	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-
2/8/11	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-
5/17/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8/18/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4/4/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/7/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/11/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7/10/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appurtenance Monitoring includes:

Ambient Air : Ambient (12" around appurtenances) and Breathing Zone (BZ)

Leak Detection : Source of potential leak (within 1" to 2" of Base, Lid, Pipe Opening [PO], Inside, View Port [VP], OverFlow [OF], Door, Conduit, Outlet, and Transmitter Joint [TJ])

NS = Not Surveyed (monitoring not part of Site-Wide Gas Assessment Work Plan).

Table 3.10 Pond 16S Appurtenance Monitoring Results Summary (Updated 2Q12)

TMP Enclosure												
Date	T-07						T-08					
	Ambient Air		Leak Detection			Inside	Ambient Air		Leak Detection			Inside
	Ambient	BZ	Base	Lid	PO		Ambient	BZ	Base	Lid	PO	
July-10	NS	NS	NS	NS	-	-	NS	NS	NS	NS	-	-
10/26/10	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-
2/8/11	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-
5/17/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8/18/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4/4/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/7/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/11/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7/10/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Date	LCDRS Sump 1 (east)					LCDRS Sump 2 (west)				
	Ambient Air		Leak Detection		Inside	Ambient Air		Leak Detection		Inside
	Ambient	BZ	Base	Lid		Ambient	BZ	Base	Lid	
July-10	NS	NS	NS	NS	-	NS	NS	NS	NS	-
10/26/10	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-
2/8/11	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-
5/17/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8/18/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
4/4/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/7/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/11/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
7/10/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.89
7/10/12										0.43

Rechecked inside on afternoon of 7/10/12.

Cap Drainage Lift Station														
Date	LS-01							LS-02						
	Ambient Air		Leak Detection				Inside	Ambient Air		Leak Detection				Inside
	Ambient	BZ	Base	Lid	VP	OF		Ambient	BZ	Base	Lid	VP	OF	
July-10	NS	NS	NS	NS	NS	NS	-	NS	NS	NS	NS	NS	NS	-
10/26/10	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	-
2/8/11	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	-
5/17/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8/18/11	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.06
4/4/12	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.04
5/7/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/11/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7/10/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appurtenance Monitoring includes:

Ambient Air : Ambient (12" around appurtenances) and Breathing Zone (BZ)

Leak Detection : Source of potential leak (within 1" to 2" of Base, Lid, Pipe Opening [PO], Inside, View Port [VP], OverFlow [OF], Door, Conduit, Outlet, and Transmitter Joint [TJ])

NS = Not Surveyed (monitoring not part of Site-Wide Gas Assessment Work Plan).

Table 3.10 Pond 16S Appurtenance Monitoring Results Summary (Updated 2Q12)

Instrumentation Panel															
Date	Temperature & Pressure					LS-01					LS-02				
	Ambient Air		Leak Detection		Inside	Ambient Air		Leak Detection		Inside	Ambient Air		Leak Detection		Inside
	Ambinet	BZ	Door	Conduit		Ambinet	BZ	Door	Conduit		Ambinet	BZ	Door	Conduit	
July-10	NS	NS	NS	NS	-	NS	NS	NS	NS	-	NS	NS	NS	NS	-
10/26/10	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-
2/8/11	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-
5/17/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8/18/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4/4/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/7/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/11/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7/10/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Instrumentation Panel										
Date	LCDRS-01					LCDRS-02				
	Ambient Air		Leak Detection		Inside	Ambient Air		Leak Detection		Inside
	Ambinet	BZ	Door	Conduit		Ambinet	BZ	Door	Conduit	
July-10	NS	NS	NS	NS	-	NS	NS	NS	NS	-
10/26/10	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-
2/8/11	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-
5/17/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8/18/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4/4/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/7/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/11/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7/10/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Perimeter Gas Collection Pipe Riser or Pressure monitor																	
Date	North				East					South				West			
	Ambient Air		Leak Detection		Ambient Air		Leak Detection			Ambient Air		Leak Detection		Ambient Air		Leak Detection	
	Ambient	BZ	Base	Outlet	Ambient	BZ	Base	Outlet	TJ	Ambient	BZ	Base	Outlet	Ambient	BZ	Base	Outlet
July-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
10/26/10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2/8/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/17/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8/18/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4/4/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/7/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/11/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7/10/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appurtenance Monitoring includes:

Ambient Air : Ambient (12" around appurtenances) and Breathing Zone (BZ)

Leak Detection : Source of potential leak (within 1" to 2" of Base, Lid, Pipe Opening [PO], Inside, View Port [VP], OverFlow [OF], Door, Conduit, Outlet, and Transmitter Joint [TJ])

NS = Not Surveyed (monitoring not part of Site-Wide Gas Assessment Work Plan).

Table 3.11 Pond 16S Soil Gas Monitoring Results Summary (Updated 2Q12)

Location	Probe # 1		Probe # 2		Probe # 3		Probe # 4		Probe # 5		Probe # 6		Probe # 7	
Date	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG
12/28/2010	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.28	0.00/0.00	0.00	0.00/0.00	0.00
1/13/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.04	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
2/2/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.01	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
3/2/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.63	0.00/0.00	0.00	0.00/0.00	0.00
4/11/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.02
5/12/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
6/7 & 6/8/2011	0.00/0.00	0.01	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	1.08	0.00/0.00	0.03	0.00/0.00	0.02
7/6/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.04	0.00/0.00	0.00	0.00/0.00	0.00
8/9/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.55	0.00/0.00	0.00	0.00/0.00	0.00
9/7/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.02	0.00/0.00	0.06
10/5/2011	0.00/0.00	0.23	0.00/0.00	0.03	0.00/0.00	0.03	0.00/0.00	0.07	0.00/0.00	2.02	0.00/0.00	0.06	0.00/0.00	0.00
11/8/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
12/8/2011	0.00/0.00	0.02	0.00/0.00	0.03	0.00/0.00	0.02	0.00/0.00	0.02	0.00/0.00	0.42	0.00/0.00	0.02	0.00/0.00	0.01
1/4/2012	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.88	0.00/0.00	0.13	0.00/0.00	0.02
2/7/2012	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.03	0.00/0.00	0.02	0.00/0.00	4.60	0.00/0.00	0.07	0.00/0.00	0.06
3/6/2012	0.00/0.00	7.95	0.00/0.00	0.05	0.00/0.00	17.00	0.00/0.00	4.89	0.00/0.00	28	0.00/0.00	24	0.00/0.00	6.70
3/21/2012	0.00/0.00	0.03	0.00/0.00	0.01	0.00/0.00	0.03	0.00/0.00	0.00	0.00/0.00	0.11	0.00/0.00	0.12	0.00/0.00	0.03
4/3/2012	0.00/0.00	0.03	0.00/0.00	0.00	0.00/0.00	0.10	0.00/0.00	0.01	0.00/0.00	0.49	0.00/0.00	4.94	0.00/0.00	0.13
5/7/2012	0.00/0.00	0.03	0.00/0.00	0.03	0.00/0.00	0.03	0.00/0.00	0.02	0.00/0.00	0.08	0.00/0.00	0.04	0.00/0.00	0.03
6/11/2012	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.01	0.00/0.00	0.00
7/9/2012	0.00/0.00	0.03	0.00/0.00	0.04	0.00/0.00	0.05	0.00/0.00	0.05	0.00/0.00	6.27	0.00/0.00	0.04	0.00/0.00	0.03

Location	Probe # 8		Probe # 9		Probe # 10		Probe # 11		Probe # 12		Probe # 13		Probe # 14	
Date	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG
12/28/2010	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
1/13/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
2/2/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.03	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
3/2/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.01	0.00/0.00	0.10	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
4/11/2011	0.00/0.00	0.01	0.00/0.00	0.02	0.00/0.00	0.00	0.00/0.00	0.01	0.00/0.00	0.02	0.00/0.00	0.02	0.00/0.00	0.00
5/12/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
6/7 & 6/8/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
7/6/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
8/9/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.05	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
9/7/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
10/5/2011	0.00/0.00	0.00	0.00/0.00	0.04	0.00/0.00	0.43	0.00/0.00	8.12	0.00/0.00	0.91	0.00/0.00	0.06	0.00/0.00	0.00
11/8/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
12/8/2011	0.00/0.00	0.01	0.00/0.00	0.02	0.00/0.00	0.00	0.00/0.00	1.51	0.00/0.00	0.00	0.00/0.00	0.01	0.00/0.00	0.00
1/4/2012	0.00/0.00	0.00	0.00/0.00	0.02	0.00/0.00	0.18	0.00/0.00	3.07	0.00/0.00	1.13	0.00/0.00	0.00	0.00/0.00	0.00
2/7/2012	0.00/0.00	0.04	0.00/0.00	0.04	0.00/0.00	0.55	0.00/0.00	45	0.00/0.00	0.75	0.00/0.00	0.04	0.00/0.00	0.00
3/6/2012	0.00/0.00	1.38	0.00/0.00	33	0.00/0.00	21	0.00/0.00	439	0.00/0.00	53	0.00/0.00	11.10	0.00/0.00	2.51
3/21/2012	0.00/0.00	0.04	0.00/0.00	0.05	0.00/0.00	1.04	0.00/0.00	3.01	0.00/0.00	13.63	0.00/0.00	0.08	0.00/0.00	0.04
4/3/2012	0.00/0.00	0.04	0.00/0.00	0.10	0.00/0.00	2.33	0.00/0.00	4.49	0.00/0.00	24	0.00/0.00	0.05	0.00/0.00	0.01
5/7/2012	0.00/0.00	0.03	0.00/0.00	0.06	0.00/0.00	0.05	0.00/0.00	0.19	0.00/0.00	0.03	0.00/0.00	0.01	0.00/0.00	0.01
6/11/2012	0.00/0.00	0.00	0.00/0.00	0.01	0.00/0.00	0.00	0.00/0.00	0.05	0.00/0.00	0.09	0.00/0.00	0.00	0.00/0.00	0.00
7/9/2012	0.00/0.00	0.04	0.00/0.00	0.03	0.00/0.00	0.03	0.00/0.00	1.50	0.00/0.00	0.01	0.00/0.00	0.02	0.00/0.00	0.02

Breathing Zone [BZ], 4-6" Above Ground Surface [AGS], and Average Soil Gas [SG] readings in ppm.

Table 3.12 Pond 16S TMP Monitoring Results Summary (Updated 2Q12)

	TMP 01		TMP 02		TMP 03		TMP 04		TMP 05		TMP 06		TMP 07		TMP 08		Pond
Date	BZ	Source	BZ	Source	BZ	Source	BZ	Source	BZ	Source	BZ	Source	BZ	Source	BZ	Source	Average
11/10/10	-	535	-	379	-	273	-	316	-	533	-	445	-	375	-	567	428
12/16/10	0.00	1,091	0.00	875	0.00	467	0.00	1,400	0.00	280	0.00	490	0.00	897	0.00	580	760
01/13/11	0.00	1,195	0.00	1,282	0.00	431	0.00	842	0.00	232	0.00	476	0.00	396	0.00	966	728
02/02/11	0.00	1,619	0.00	1,174	0.00	460	0.00	1,005	0.00	887	0.00	558	0.00	507	0.00	1,040	906
03/02/11	0.00	1,960	0.00	1,350	0.00	517	0.00	982	0.00	1,246	0.00	713	0.00	685	0.00	1,021	1,059
04/11/11	0.00	1,703	0.00	827	0.00	457	0.00	835	0.00	2,383	0.00	1,227	0.00	2,068	0.00	1,476	1,372
05/11/11	0.00	2,296	0.00	905	0.00	366	0.00	655	0.00	3,222	0.00	2,390	0.00	2,037	0.00	1,440	1,664
06/08/11	0.00	3,210	0.00	974	0.00	279	0.00	740	0.00	3,187	0.00	3,180	0.00	1,978	0.00	1,417	1,871
07/06/11	0.00	3,932	0.00	1,026	0.00	399	0.00	690	0.00	3,918	0.00	4,255	0.00	2,350	0.00	1,744	2,289
08/09/11	0.00	4,774	0.00	1,280	0.00	488	0.00	897	0.00	6,053	0.00	5,122	0.00	3,477	0.00	2,064	3,019
09/07/11	0.00	6,048	0.00	1,202	0.00	269	0.00	1,003	0.00	6,653	0.00	6,083	0.00	3,644	0.00	2,511	3,427
10/05/11	0.00	7,329	0.00	1,662	0.00	527	0.00	1,386	0.00	6,478	0.00	5,525	0.00	3,462	0.00	2,907	3,660
11/09/11	0.00	7,707	0.00	1,624	0.00	667	0.00	1,429	0.00	7,455	0.00	6,494	0.00	4,414	0.00	4,454	4,281
12/7 & 12/8/2011	0.00	9,112	0.00	1,772	0.00	678	0.00	1,249	0.00	9,154	0.00	8,774	0.00	5,775	0.00	5,389	5,238
01/04/12	0.00	13,658	0.00	2,307	0.00	1,186	0.00	2,124	0.00	15,530	0.00	10,343	0.00	6,233	0.00	6,159	7,193
02/07/12	0.00	15,526	0.00	3,471	0.00	1,745	0.00	2,721	0.00	24,260	0.00	17,459	0.00	11,324	0.00	10,095	10,825
03/07/12	0.00	19,567	0.00	4,271	0.00	2,845	0.00	3,504	0.00	26,940	0.00	22,338	0.00	12,035	0.00	11,619	12,890
04/06/12	0.00	20,078	0.00	5,121	0.00	3,041	0.00	4,596	0.00	23,528	0.00	21,169	0.00	13,320	0.00	12,819	12,959
05/08/12	0.00	23,737	0.00	6,443	0.00	4,017	0.00	5,398	0.00	31,920	0.00	23,968	0.00	15,255	0.00	12,158	15,362
06/11/12	0.00	25,363	0.00	7,628	0.00	4,684	0.00	5,024	0.00	36,390	0.00	27,690	0.00	18,342	0.00	14,603	17,466
07/09/12	0.00	26,137	0.00	8,391	0.00	5,063	0.00	5,418	0.00	41,415	0.00	27,953	0.00	17,329	0.00	15,400	18,388

Notes:

November 10, 2011 results measured during Pond 16S GETS operation, all other results using GETS for TMP monitoring per Assessment Study Work Plan.

Breathing Zone (BZ) and Source Gas Concentrations in ppm.

Table 3.14 Pond 18A Appurtenance Monitoring Results Summary (Updated 2Q12)

TMP Enclosure																
	T-01						T-02						T-03			
	Ambient Air		Leak Detection		Inside	Ambient Air		Leak Detection		Inside	Ambient Air		Leak Detection		Inside	
Date	Ambient	BZ	Base	Lid		Ambient	BZ	Base	Lid		Ambient	BZ	Base	Lid		
7/28/10	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
10/25/10	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
11/23/10	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
12/20/10	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
1/18/11	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
2/23/11	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	11.50	0.00	-	
2/24/11	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	
3/16/11	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
4/19/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5/18/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6/15/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	
7/12/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
8/9/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
9/14/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10/10/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10/25/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
11/8/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
11/21/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
12/20/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1/13/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4/5/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5/9/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6/5/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7/5/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Note: Recompacted soil around T-03 base and re-sampled.

Note: Re-sampled T-03 after tightening loose flange.

LCDRS Sump					
Date	Ambient Air		Leak Detection		Inside
	Ambient	BZ	Base	Lid	
7/28/10	0.00	0.00	NS	0.00	-
10/25/10	0.00	0.00	0.00	0.00	-
11/23/10	0.00	0.00	0.00	0.00	-
12/20/10	0.00	0.00	0.00	0.00	-
1/18/11	0.00	0.00	0.00	0.00	-
2/23/11	0.00	0.00	0.00	0.00	-
3/16/11	0.00	0.00	0.00	0.00	-
4/19/11	0.00	0.00	0.00	0.00	0.00
5/18/11	0.00	0.00	0.00	0.00	0.00
6/15/11	0.00	0.00	0.00	0.00	0.00
7/12/11	0.00	0.00	0.00	0.00	0.00
8/9/11	0.00	0.00	0.00	0.00	0.00
9/14/11	0.00	0.00	0.00	0.00	0.00
10/10/11	0.00	0.00	0.00	0.00	0.00
10/25/11	0.00	0.00	0.00	0.00	0.00
11/8/11	0.00	0.00	0.00	0.00	0.00
11/21/11	0.00	0.00	0.00	0.00	0.00
12/20/11	0.00	0.00	0.00	0.00	0.00
1/13/12	0.00	0.00	0.00	0.00	0.04
4/5/12	0.00	0.00	0.00	0.00	0.00
5/9/12	0.00	0.00	0.00	0.00	0.00
6/5/12	0.00	0.00	0.00	0.00	0.00
7/5/12	0.00	0.00	0.00	0.00	0.00

	Cap Drainage Lift Station													
	LS-01							Inside	LS-02					
	Ambient Air		Leak Detection				Ambient Air		Leak Detection				Inside	
	Date	Ambient	BZ	Base	Lid	VP	OF		Ambient	BZ	Base	Lid		VP
7/28/10	0.00	0.00	NS	0.00	NS	NS	-	0.00	0.00	NS	0.00	NS	NS	-
10/25/10	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	-
11/23/10	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	-
12/20/10	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	-
1/18/11	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	-
2/23/11	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	-
3/16/11	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	-
4/19/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/18/11	0.00	0.00	0.00	0.00	0.00	0.00	1.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/15/11	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7/12/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8/9/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9/14/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/10/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/25/11	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/8/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/21/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12/20/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1/13/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4/5/12	0.00	0.00	0.00	0.00	0.00	0.00	3.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/9/12	0.00	0.00	0.00	0.00	0.00	0.00	10.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/5/12	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7/5/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appurtenance Monitoring includes:

Ambient Air : Ambient (12" around appurtenances) and Breathing Zone (BZ)

Leak Detection : Source of potential leak (within 1" to 2" of Base, Lid, Inside, View Port [VP], OverFlow [OF], Door, Conduit, Outlet, and Transmitter Joint [TJ])

NS = Not Surveyed (monitoring not part of Site-Wide Gas Assessment Work Plan).

Table 3.14 Pond 18A Appurtenance Monitoring Results Summary (Updated 2Q12)

Date	Instrumentation Panel																			
	Temperature & Pressure					LS-01					LS-02					LCDRS				
	Ambient Air		Leak Detection		Inside	Ambient Air		Leak Detection		Inside	Ambient Air		Leak Detection		Inside	Ambient Air		Leak Detection		Inside
	Ambinet	BZ	Door	Conduit		Ambinet	BZ	Door	Conduit		Ambinet	BZ	Door	Conduit		Ambinet	BZ	Door	Conduit	
7/28/10	NS	NS	NS	NS	-	NS	NS	NS	NS	-	NS	NS	NS	NS	-	NS	NS	NS	NS	-
10/25/10	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-
11/23/10	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-
12/20/10	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-
1/18/11	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-
2/23/11	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-
3/16/11	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-
4/19/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/18/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/15/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7/12/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8/9/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9/14/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/10/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/25/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/8/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/21/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12/20/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1/13/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4/5/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/9/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/5/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7/5/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Perimeter Gas Collection Pipe Riser or Pressure Monitor									
Date	East Side					South Side			
	Ambient Air		Leak Detection			Ambient Air		Leak Detection	
	Ambient	BZ	Base	Outlet	TJ	Ambient	BZ	Base	Outlet
7/28/10	NS	NS	NS	NS	NS	NS	NS	NS	NS
10/25/10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/23/10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12/20/10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1/18/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2/23/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3/16/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4/19/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/18/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/15/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7/12/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8/9/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9/14/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/10/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/25/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/8/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/21/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12/20/11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1/13/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4/5/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/9/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/5/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7/5/12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appurtenance Monitoring includes:

Ambient Air : Ambient (12" around appurtenances) and Breathing Zone (BZ)

Leak Detection : Source of potential leak (within 1" to 2" of Base, Lid, Inside, View Port [VP], OverFlow [OF], Door, Conduit, Outlet, and Transmitter Joint [TJ])

NS = Not Surveyed (monitoring not part of Site-Wide Gas Assessment Work Plan).

Table 3.16 Pond 18A Soil Gas Monitoring Results Summary (Updated 2Q12)

Perimeter Shallow Probes																				
Location	Probe # 1		Probe # 2		Probe # 3		Probe # 4		Probe # 5		Probe # 6		Probe # 7		Probe # 8		Probe # 9		Probe # 10	
Date	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG
7/26/2010	0.00/0.00	0.00	0.00/0.00	2.81	0.00/0.00	0.63	0.00/0.00	58	0.00/0.00	0.01	0.00/0.00	0.21	0.00/0.00	0.00	0.00/0.00	0.04	0.00/0.00	0.03	0.00/0.00	0.00
12/16/2010	0.00/0.00	0.08	0.00/0.00	19	0.00/0.00	1.58	0.00/0.00	55	0.00/0.00	0.04	0.00/0.00	1.34	0.00/0.00	0.02	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
1/18/2011	0.00/0.00	0.11	0.00/0.00	156	0.00/0.00	3.99	0.00/0.00	658	0.00/0.00	0.32	0.00/0.00	2.74	0.00/0.00	0.01	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
2/22/2011	0.00/0.00	0.00	0.00/0.00	106	0.00/0.00	121	0.00/0.00	1000+	0.00/0.00	0.68	0.00/0.00	0.17	0.00/0.00	0.02	0.00/0.00	0.04	0.00/0.00	0.00	0.00/0.00	0.00
3/3/2011	0.00/0.00	0.00	0.00/0.00	6.75	0.00/0.00	3.30	0.00/0.00	1000+	0.00/0.00	0.03	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
4/12/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
5/4/2011	0.00/0.00	0.00	0.00/0.00	0.02	0.00/0.00	0.00	0.00/0.00	0.02	0.00/0.00	0.01	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
5/25/2011	0.00/0.00	0.03	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
6/20/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
7/27/2011	0.00/0.00	0.03	0.00/0.00	0.02	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.03	0.00/0.00	0.00	0.00/0.00	0.00
8/24/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
9/20/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
10/10/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
10/25/2011	0.00/0.00	0.00	0.00/0.00	0.19	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
11/8/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
11/21/2011	0.00/0.00	0.02	0.00/0.00	0.09	0.00/0.00	0.02	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
12/20/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.03	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
1/13/2012	0.00/0.00	0.00	0.00/0.00	3.68	0.00/0.00	0.02	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
2/7/2012	0.00/0.00	0.00	0.00/0.00	1.06	0.00/0.00	0.00	0.00/0.00	0.07	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
3/6/2012	0.00/0.00	0.07	0.00/0.00	38	0.00/0.00	6.92	0.00/0.00	23	0.00/0.00	0.08	0.00/0.00	0.71	0.00/0.00	0.02	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
3/22/2012	0.00/0.00	0.00	0.00/0.00	0.04	0.00/0.00	0.12	0.00/0.00	0.78	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.02
4/3/2012	0.00/0.00	0.17	0.00/0.00	5.04	0.00/0.00	0.15	0.00/0.00	1.41	0.00/0.00	0.04	0.00/0.00	0.34	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
5/8/2012	0.00/0.00	0.05	0.00/0.00	0.27	0.00/0.00	0.02	0.00/0.00	0.00	0.00/0.00	0.01	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.01
6/5/2012	0.00/0.00	0.00	0.00/0.00	9.70	0.00/0.00	0.58	0.00/0.00	6.07	0.00/0.00	0.00	0.00/0.00	0.06	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
7/5/2012	0.00/0.00	0.00	0.00/0.00	0.49	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.01	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00

Breathing Zone [BZ], 4-6" Above Ground Surface [AGS], and Average Soil Gas [SG] readings in ppm.

Table 3.16 Pond 18A Soil Gas Monitoring Results Summary (Updated 2Q12)

Step-Out Probes																
Location	Probe # 2A		Probe # 4A		Probe # 7A		Probe # 9A		Probe # LS-1 A		Probe # LS-1 B		Probe # LS-2 A		Probe # LS-2 B	
Monitor Elevation	4448.7		4448.7		4448.7		4448.7		4449.2		4449.2		4450.0		4450.0	
Depth Below Ground Surface (ft)	3.25		3.50		3.00		2.50		2.85		2.85		3.00		3.00	
Date	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG	BZ/AGS	SG
5/4/2011	0.00/0.00	0.01	0.00/0.00	0.06	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.03
5/25/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.01	0.00/0.00	0.00	0.00/0.00	0.04	0.00/0.00	0.03
6/20/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
7/27/11	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
8/24/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
9/20/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
10/10/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
10/25/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
11/8/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
11/21/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
12/20/2011	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
1/13/2012	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
2/7/2012	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00
3/6/2012	0.00/0.00	1.57	0.00/0.00	0.04	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	4.25	0.00/0.00	1.79
3/22/2012	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.01	0.00/0.00	0.00	0.00/0.00	0.00
4/3/2012	0.00/0.00	0.04	0.00/0.00	0.04	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	1.27	0.00/0.00	0.51
5/8/2012	0.00/0.00	0.03	0.00/0.00	0.04	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.02	0.00/0.00	0.16
6/5/2012	0.00/0.00	0.04	0.00/0.00	0.04	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.01	0.00/0.00	0.00	0.00/0.00	0.00
7/5/2012	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00	0.00/0.00	0.00

Breathing Zone [BZ] and Average Soil Gas [SG] readings in ppm.

Table 4.1 Pond 16S Summary of TMP and Perimeter Standpipe Average Purge Volume and Estimated Area of Influence during Monitoring

Pond 16S TMPs	Flow (scfm)	Time (min)	Vol purged (cf)	Effective Porosity [1]	Vol soil purged (cf)	Effective Height of Zone [2] (ft)	Radius around TMP purged (ft)		
TMP initial purge	10	10	100	0.1	1,000	3	10.3		
TMP during readings	1	20	20	0.1	200	3	4.6		
Ave TMP flow / total purge	4	30	120	0.1	1,200	3	11.3		
Pond 16S Standpipes	Flow (scfm)	Time (min)	Vol purged (cf)	Area 2-inch pipe (sf)	Length pipe purged (ft)	Radius of Zone around pipe (ft)	Effective Porosity [1]	Effective Area of Zone (sf)	Effective Length of Zone (ft)
North Standpipe (purge)	5.5	17 [3]	94	0.022	4,286	2	0.1	1.28	73.3
North Standpipe (readings)	5.5	30	165	0.022	7,563	2	0.1	1.28	129.3
North Standpipe (total)	5.5	47	259	0.022	11,849	2	0.1	1.28	202.5
Other S, E and W standpipes	9.5	30	285	0.022	13,063	2	0.1	1.28	223.3

[1] Effective porosity (unitless) estimated for the fill (slag and/or sand) surrounding the TMPs / perimeter pipe in the zone of influence during purging.

[2] TMP zone of influence during purging is assumed to be a cylinder of soil surrounding the TMP extending 1.5 feet above and below the bottom of the TMP.

[3] North standpipe purged 17 minutes at 5.5 scfm to purge approximately 1 perimeter pipe system volume (Pond 16S = 4,200 ft in length [90 cf]).

Table 5.1 RCRA Pond Phosphine Monitoring Programs into 2012¹ (Updated 2Q12)

Pond	Air Monitoring Plan ²		Soil Gas	Perimeter pipe	TMP
	Surface Scan	Appurtenance			
8S	Annual (3Q 12) ³	Annual (3Q 12)	None	None	None
9E	Annual (3Q 12)	Annual (3Q 12)	None	None	None
Phase IV	Annual (3Q 12)	Annual (3Q 12)	None	None	None
8E	QTR (4Q 11) ⁴	QTR (4Q 11)	None	None	None
17	QTR (4Q 11)	QTR (4Q 11)	None	None	None
18A	Monthly (May 12) ⁵	Monthly (May 12) ⁵	Monthly	Monthly	None
16S	Monthly (April 12) ⁶	Monthly (April 12) ⁶	Monthly	Monthly	Monthly
15S	QTR (4Q 11) plus Addendum A ⁷	QTR (4Q 11) plus Addendum A ⁷	Monthly plus Addendum A ⁷	East - GES ops	TMP #2 and #6 GES ops - others monthly

Notes:

¹ Shaded cells indicate recommended monitoring pursuant to extension of the Phosphine Assessment Monitoring program into the second half of 2012. FMC performed the 1Q12 quarterly updated evaluations for Ponds 16S and 18A that documents triggering increased monitoring at Pond 16S per the Air Monitoring Plan. Any future updates will potentially include recommendation(s) for further modification of the monitoring program and/or commencing gas extraction and treatment at these ponds.

² RCRA Pond UAO – SOW Task 1 – Air Monitoring Plan – Part I and Part II, January 2011.

³ Quarter and year indicates next scheduled round of monitoring based on the annual frequency.

⁴ QTR means quarterly frequency and quarter and year monitoring began at quarterly frequency.

⁵ As recommended in the Assessment Study 1Q12 Update Tech Memo, monthly frequency began May 2012.

⁶ As reported in the 1Q12 Tech Memo, the Pond 16S north perimeter pipe monitoring result on April 3, 2012 was greater than 2,000 ppm which triggered monthly cap perimeter and appurtenance monitoring that was initiated in April per the Air Monitoring Plan.

⁷ Pond 15S Interim Work Plan Addendum A, December 2011.

FIGURE 4-3. Pond 16S Average TMP and Perimeter Individual and Average Standpipe PH3 Concentration (Updated 2Q12)

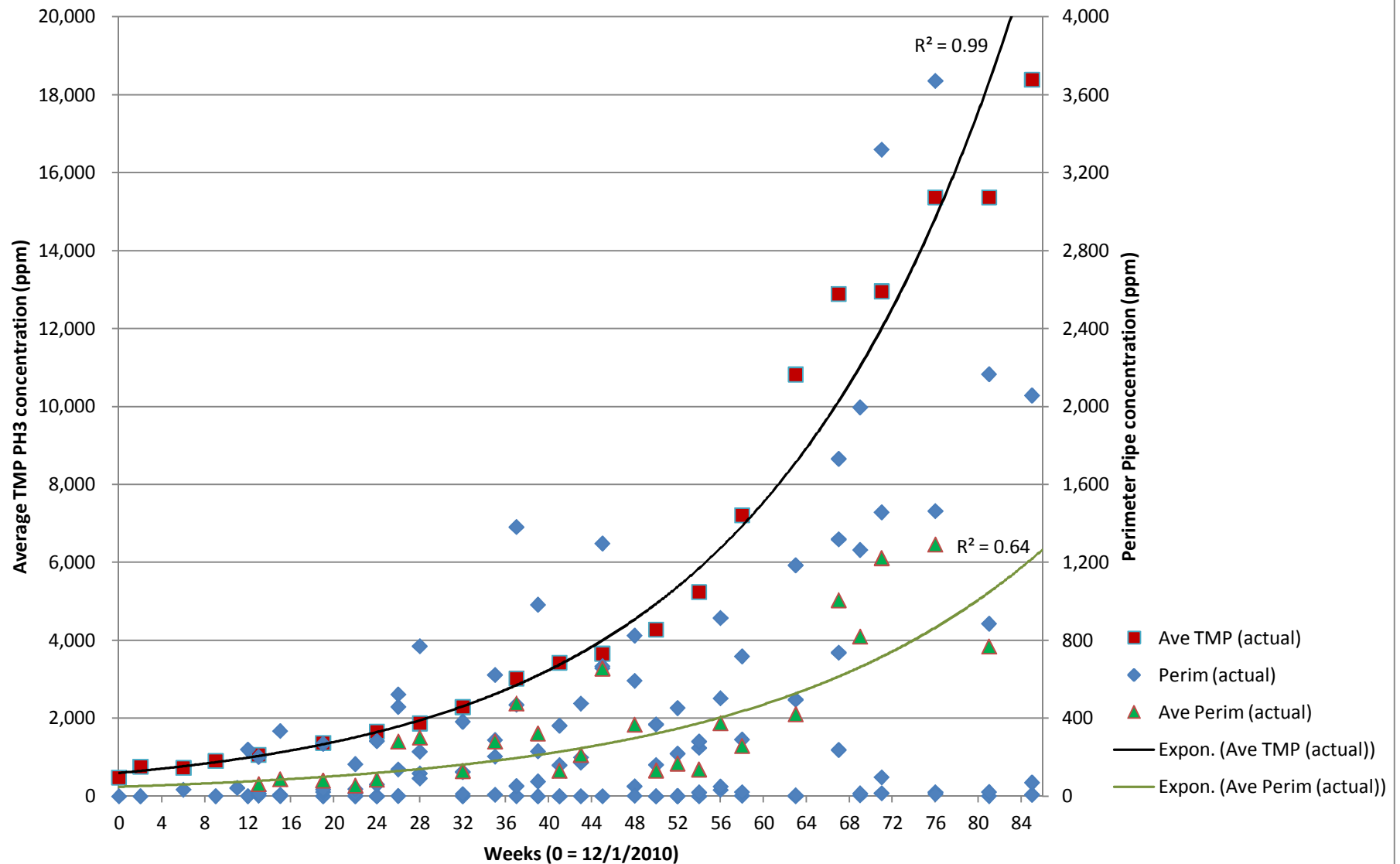


Figure 4-4. Pond 16S TMP Phosphine Concentrations (Updated 2Q12)

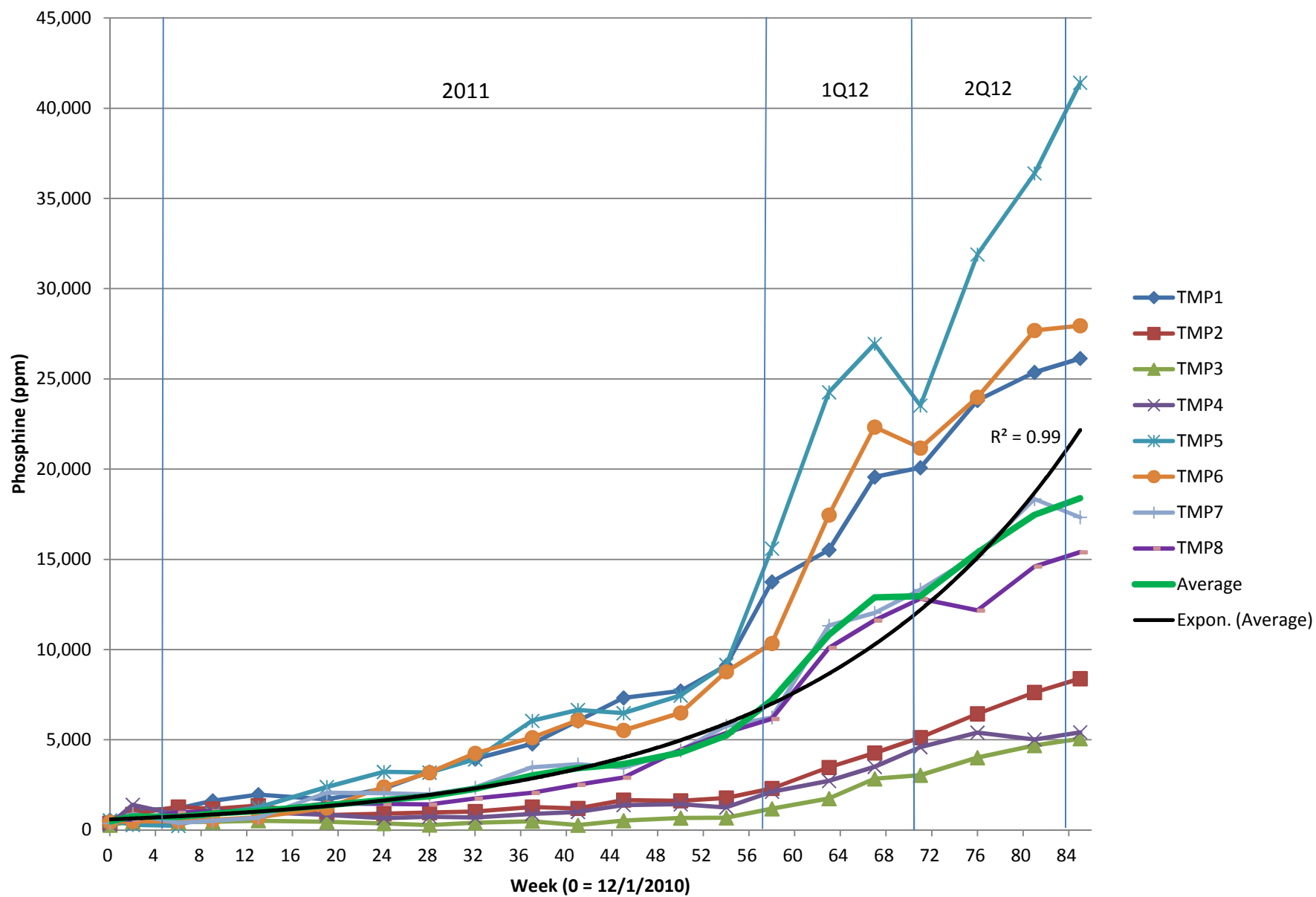


Figure 4-5. Pond 16S Perimeter Pipe Phosphine Concentrations (Updated 2Q12)

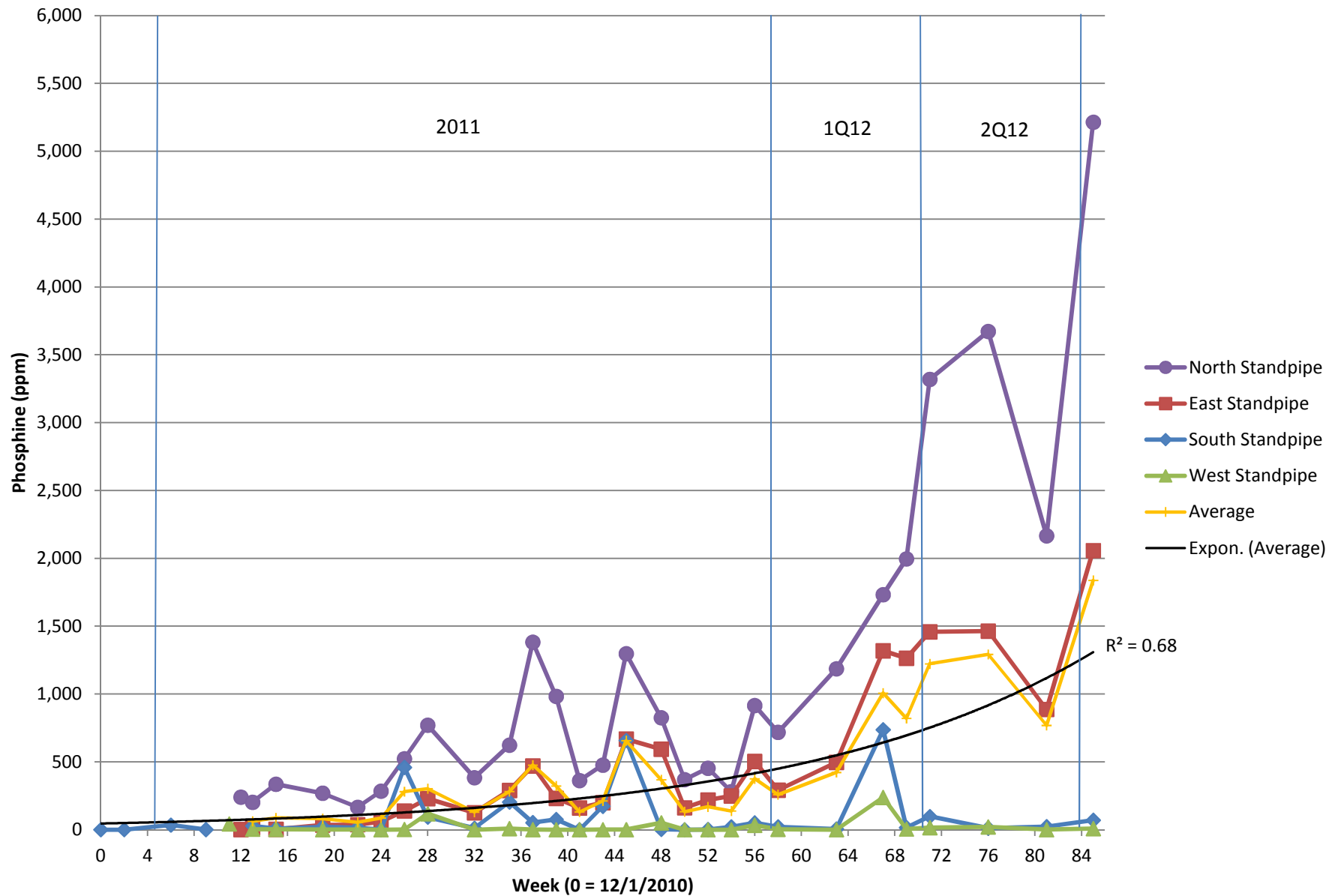


Figure 4-7. Pond 16S Soil Gas Probe Phosphine Concentrations (Updated 2Q12)

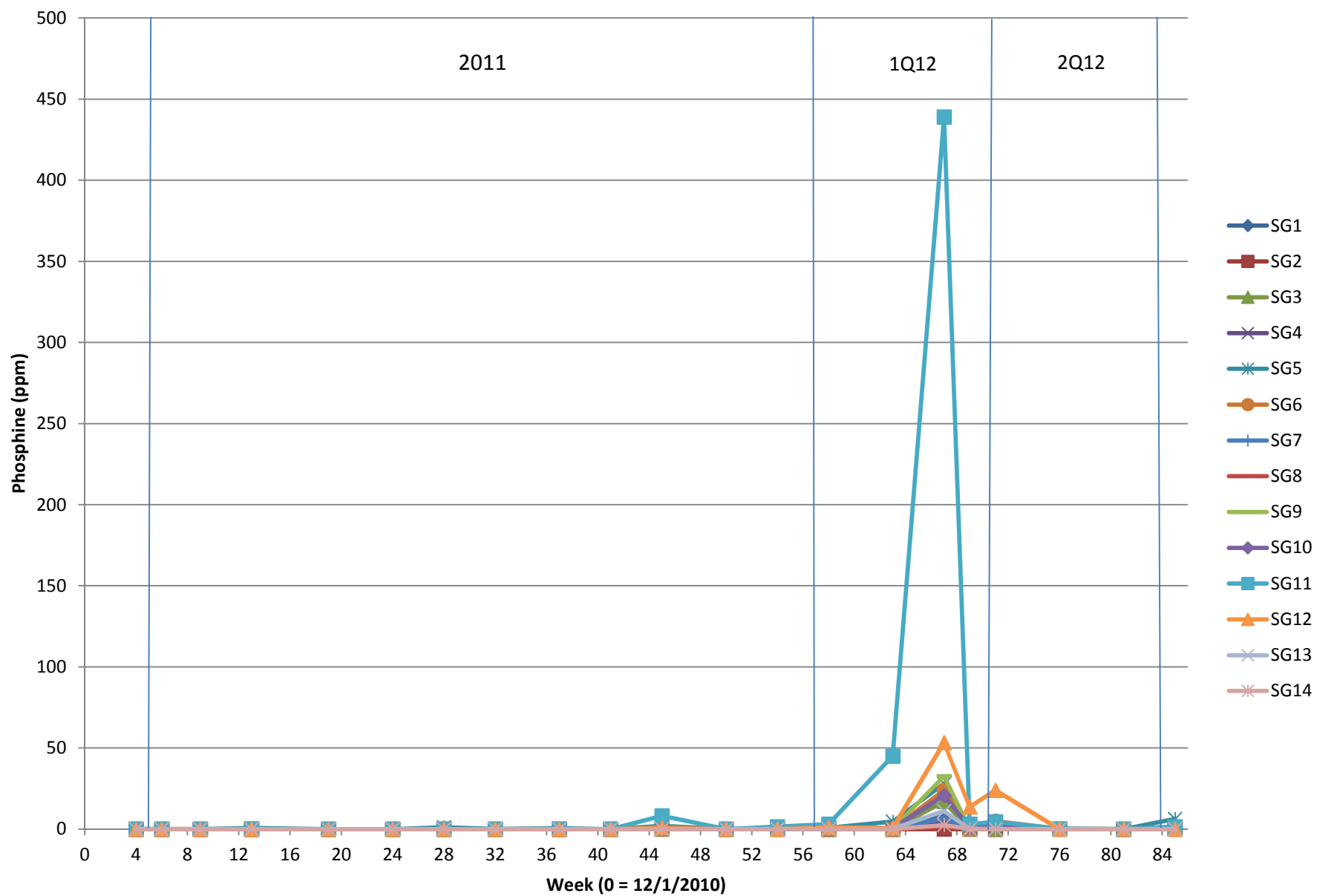
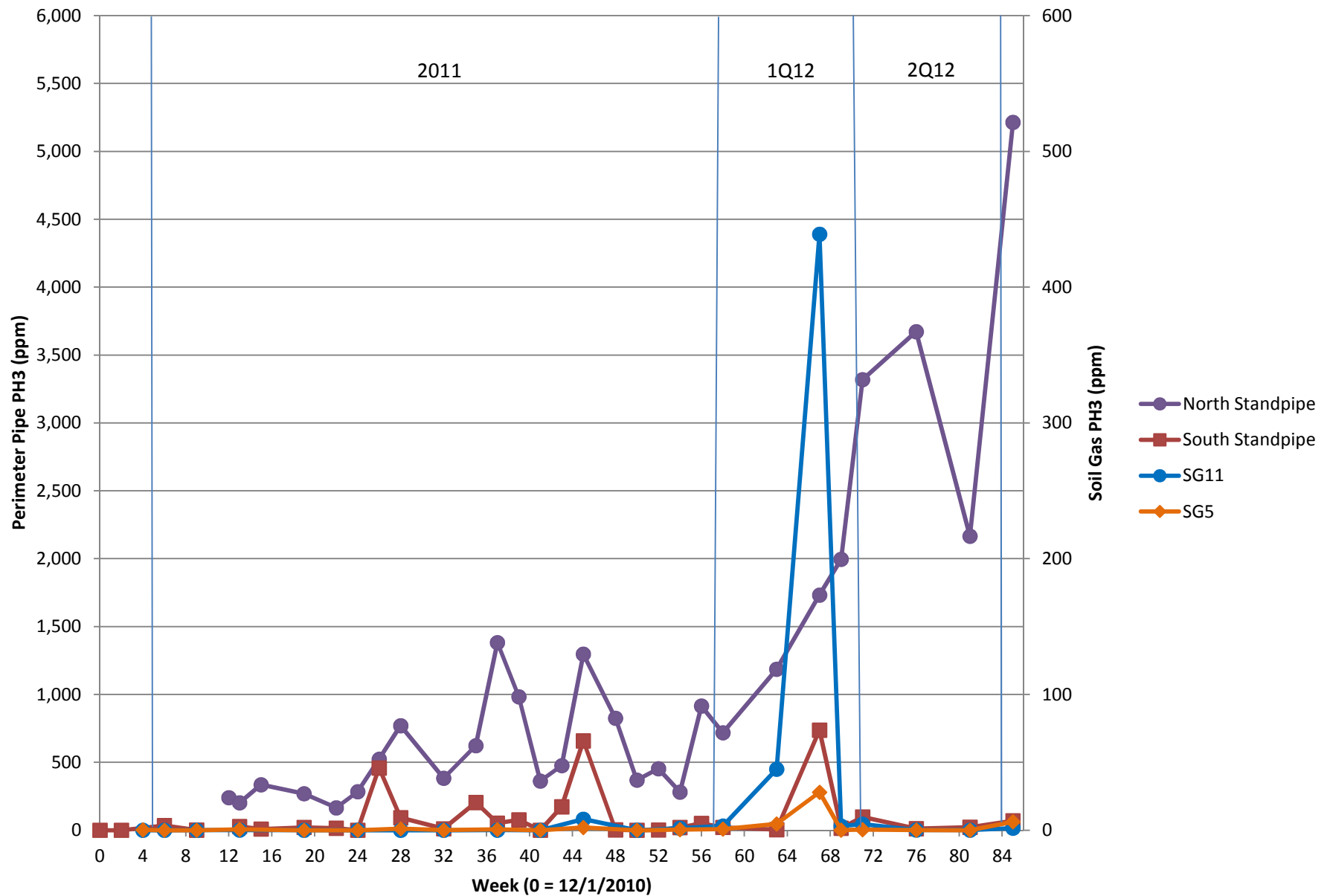


Figure 4-8. Pond 16S N and S Perimeter Pipe and Soil Gas 5 and 11 (Updated 2Q12)



East Standpipe (SP) Monthly GES Average March 31 to Oct 5, 2011

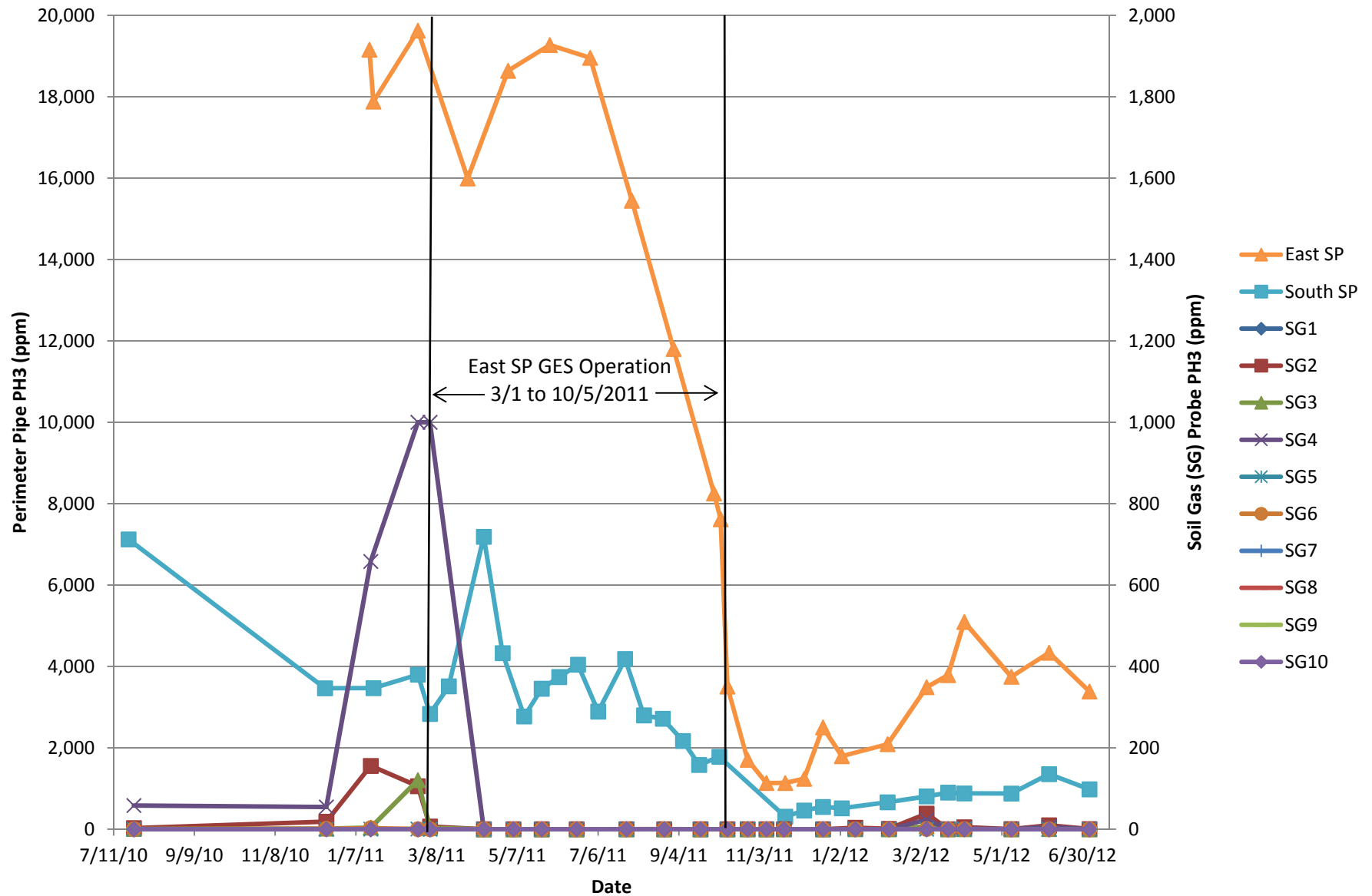


Figure 4-12. Pond 18A Perimeter Pipe and Shallow Soil Gas (Updated 2Q12)
October 2011 to July 2012

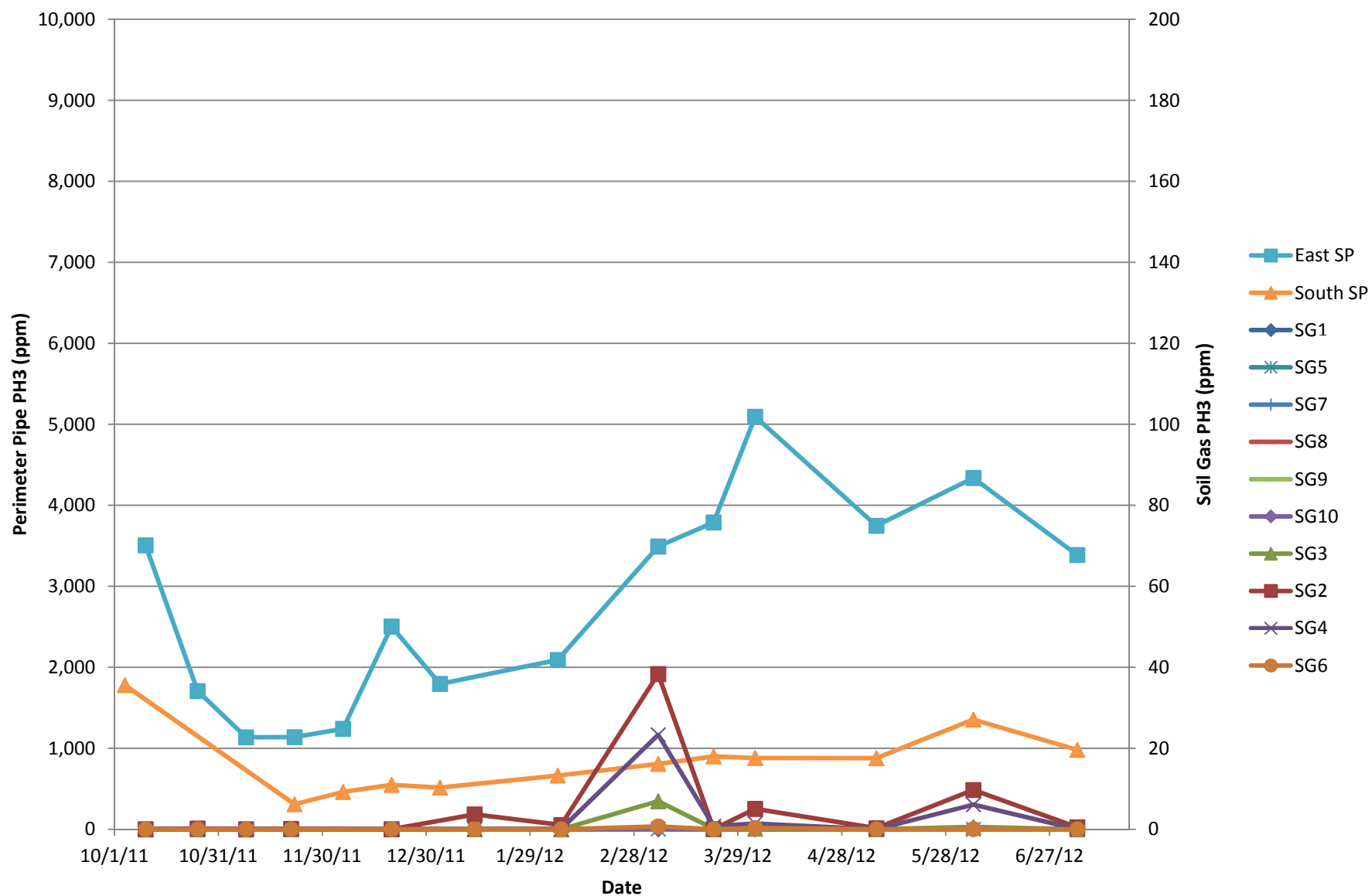


Figure 5-1a. Pond 16S TMP, Perimeter Pipe and Soil Gas Trends (Updated 2Q12)

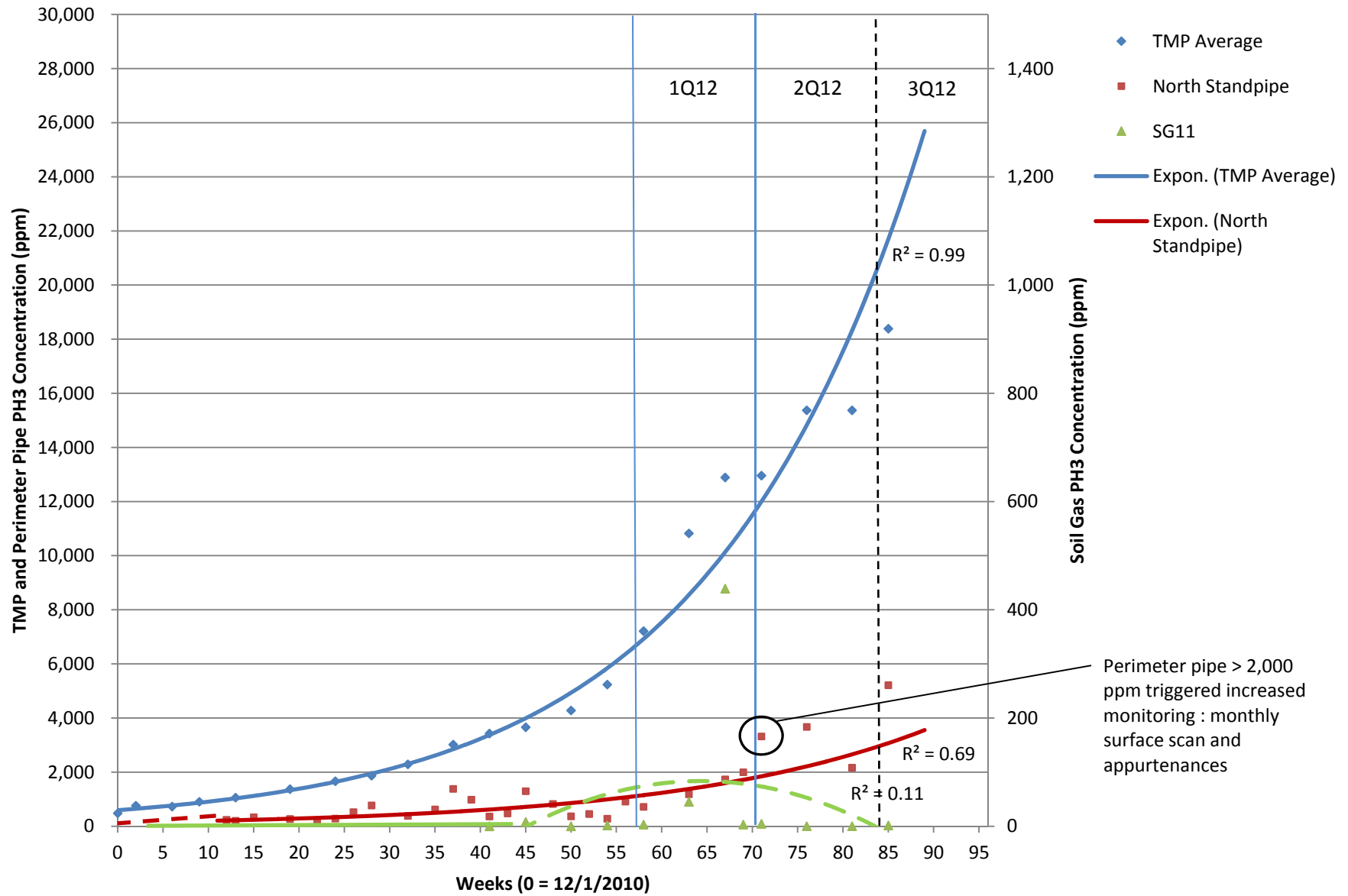


Figure 5-1b. Pond 16S TMP, Perimeter Pipe and Soil Gas Trends (Updated 2Q12)
Regression on North Standpipe Week 50 Forward

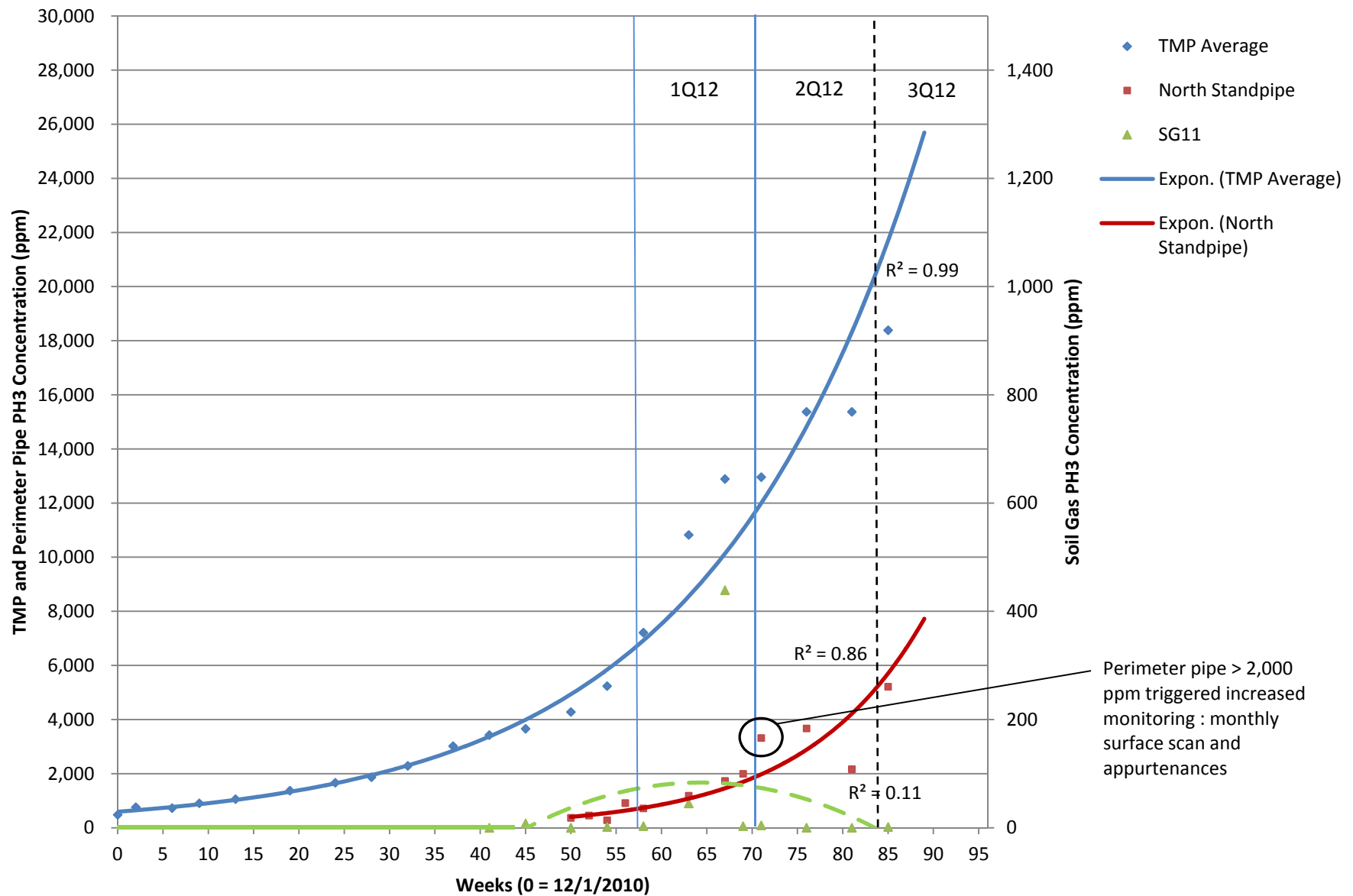


Figure 5-2. Pond 18A Perimeter Pipe and Shallow Soil Gas Trends (Updated 2Q12)

November 21, 2011 to July 5, 2012 Actual

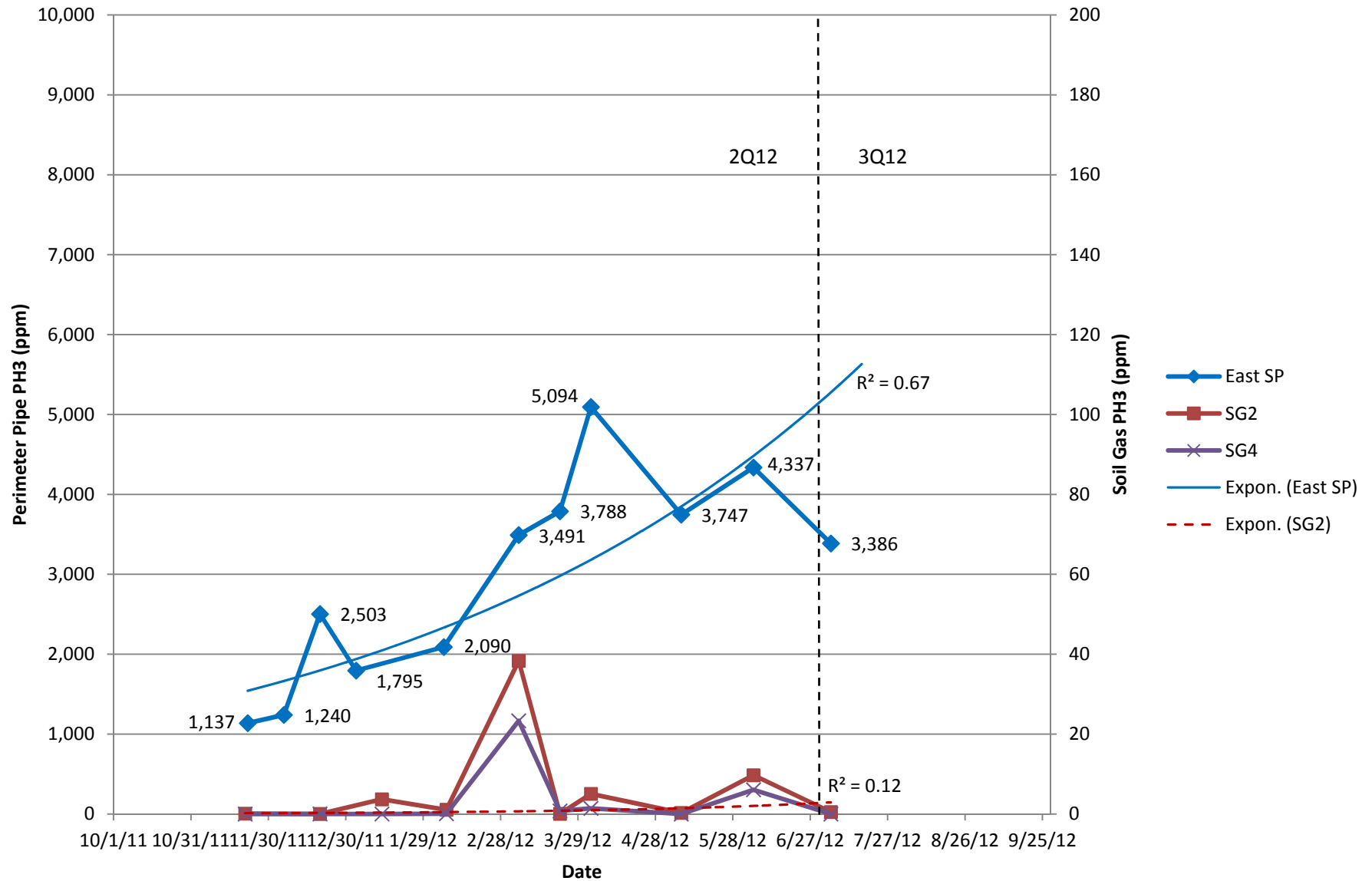


Figure 5-3. Pond 18A Perimeter Pipe - Extraction and Rebound Trends through July 5, 2012
East Standpipe (SP) Monthly GES Average March 31 to Oct 5, 2011

